NETWORK WORLD
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FCC plans to open bypass net options

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The Federal Communications Commission last week said alternative access providers should be allowed to collocate transmission equipment in the central offices of major local exchange carriers.

The FCC's position, posted in a notice of proposed rule making, would increase the options users have for linking their sites to interexchange carrier points of presence via private lines.

Bypass carriers are currently limited to serving customers in buildings linked to their fiber-optic networks. Collocation would enable them to pick up private-line traffic anywhere within a given local access and transport area.

The FCC said it would allow the local carriers to decide whether they will house rivals' equipment in their central offices or offer virtual collocation, in which rivals would house equipment in nearby buildings and simply run circuits into the switches.

The charges and types of links would be the same with either configuration.

Officials from alternative access providers said the FCC's de-

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PHOTO ©1991 CAROL HALEBIAN

Merrill Lynch's DuWayne Peterson keynotes Financial Networks event.

Financial industry sees nets as key to rebound

Looks to technology to ease late '80s hangover.

By Barton Crockett
Senior Editor

NEW YORK — After three years of declining fortunes, capped by their worst year ever in 1990, brokerage firms are revamping network operations to help survive the economic squeeze.

Attendees at the Financial Networks Conference here last week, hosted by *Network World* and Digital Consulting, Inc., said declining fortunes have forced firms to shake up management practices and implement strategic net projects to deal with a tougher business environment.

"The [mid] 1980s were boom-boom, go-go years, where everybody was focused on capturing market share and not on containing costs," said John Lane, executive vice-president and director of telecommunications at Shearson Lehman Brothers, Inc. here. "What the downturn did was force people to [emphasize] cost-consciousness."

The downturn in the brokerage business is particularly dramatic because the industry rode so high for so many years. For example, from 1980 to 1986, expenditures on information sys-

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AT&T buys NCR to anchor computer unit

NCR's products, technical expertise pivotal to AT&T strategy of one-stop shopping for computers, nets.

By Bob Brown
Senior Editor

NEW YORK — Ending five months of often bitter negotiations, NCR last week accepted AT&T's $7.48 billion takeover offer, giving AT&T the computer products and expertise it needs to become one of the leading providers of network computers and services.

The union will enable AT&T to draw on NCR's strength in computers to offer users one-stop shopping for network services and computers — a combination that other vendors would be hard pressed to match, analysts said.

Under the terms of the acquisition, NCR will be positioned as the core of AT&T's computing business and will keep its name, management team and Dayton, Ohio, headquarters.

AT&T's existing Computer Systems unit will be folded into NCR, although AT&T did not specify how the company would resolve overlapping product lines.

AT&T pursued NCR for its widely praised Open Cooperative Computing Architecture (OCCA), strong international presence and vertical-industry expertise in retail and finance, according to AT&T Chairman Robert Allen.

"The company that will

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PHOTO ©1991 JOHN THOMPSON

Banyan's David Mahoney

Banyan to open VINES' net services

By Timothy O'Brien
West Coast Bureau Chief

WESTBOROUGH, Mass. — For years, Banyan Systems, Inc. has struggled to position its highly regarded networking technology against that of market leader Novell, Inc. Now Banyan President and CEO David Mahoney believes the company may have finally found the answer.

In discussions with *Network World,* Mahoney and Jim D'Arezzo, Banyan's vice-president of marketing, indicated that Banyan will break out the distributed naming/directory and wide-area networking capabilities of its VINES network operating system and make them available for a variety of Unix platforms and potentially even Novell NetWare local-area networks.

Providing users of Unix and other LANs with proven directory and internetworking technol-

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NETLINE

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N.Y. TEL TO ROLL OUT alternative routing service for switched traffic in response to user needs. Page 4.

NETWORK SYSTEMS hopes to win a big chunk of the internet mart by buying Vitalink. Page 4.

RACAL DATA'S new all-in-one networking package eases device interconnection, net management. Page 4.

NOVELL SIGNS ON 11 companies to its Technical Support Alliance program. Page 4.

NETWORK SECURITY holds a myriad of risks and challenges for today's network managers. Page 45.

CANADIAN GOV'T signs $45 million pact for as many as 800 Banyan VINES local-area networks. Page 74.

NEWSPAPER

FEATURE

Why router firms seek to storm the bastions of SNA

By Paul Desmond
Senior Editor

The downsizing movement that has seen users replace mainframes with local-area networks may be entering a new realm. Multiprotocol routers are emerging as a potential replacement for some IBM front-end processors, a development that could provide users with increased networking flexibility at a lower cost.

However, not everyone is convinced that the multiprotocol router vendors have what it takes to tackle Systems Network Architecture routing, which until now has been the domain of front-end processors — large, expensive beasts that run IBM software so complicated that only a handful of vendors have been able to duplicate it.

Still, router vendors such as Cisco Systems, Inc. and Vitalink Communications Corp. insist that they will add SNA to the dozen or so other protocols their routers support.

This news has some users and analysts predicting the death of the remote front

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GEIS rolls out software system for sales support

Offering helps users automate functions, such as lead tracking, order entry, price and product info.

By Maureen Molloy
Staff Writer

ROCKVILLE, Md. — GE Information Services (GEIS) last week introduced a personal computer software system designed to improve the productivity of sales personnel by automating standard sales support activities and integrating them with value-added network (VAN) services.

GEIS is the first major corporation to enter the sales automation market, which is now largely dominated by small companies, said Roberta Wiggins, a senior analyst with The Yankee Group, a market research firm in Boston.

"More than 60% of corporations that haven't automated their sales and marketing functions plan to do so in the 1990s," Wiggins said. "GEIS clearly understands the market and is positioning itself in the systems integration/application development arena."

IBM and AT&T are expected to roll out similar systems within the next year, she added.

GEIS' new Sales Marketing Communication System (SMCS), which combines an integrated software package with GEIS net services, is intended to help users automate sales functions such as lead tracking, order entry, scheduling, sales forecasts, and price and product information.

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ISDN products let public net support ACD functions

Call distribution system eliminates switching gear.

By Bob Brown
Senior Editor

BILLERICA, Mass. — Unifi Communications Corp. last week announced products that will enable users to build call distribution systems based on public ISDN services, obviating the need for automatic call distributor (ACD) customer premises equipment.

The product, a series of software programs called PhoneServer, includes a component that runs on an on-site controller and enables users to route calls to local or remote agents, as well as people working at home.

"Our software eliminates the need for proprietary switching equipment like PBXs and ACDs," said Bob Pokress, Unifi's president and chief executive officer. "Users can deploy agents where it's most convenient, rather than locating them in a call center."

PhoneServer is the first product from Unifi, which was founded in September 1989 and last week secured $6.1 million in an additional round of financing from venture capital firms.

PhoneServer is based on a client/server architecture and comprises three components: Controller, Manager and Client software programs.

The Controller software can be run on any Unix-based com-

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Users say new MAP tools will drive net applications

By Paul Desmond
Senior Editor

NASHVILLE — Users are confident that the Manufacturing Automation Protocol is on the verge of widespread acceptance, thanks in part to emerging tools that mask its complexity and make it easier to develop MAP-based applications.

That was the consensus of users and analysts interviewed here at last week's North American MAP/TOP Users Group Spring Conference. Users, analysts and vendors agreed that the availability of application enablers means that MAP network implementation has been simplified, which should further the acceptance of the protocol. In addition, the enablers are a sign of the maturity of the MAP 3.0 specification.

Sessions on application enablers accounted for a third of the conference schedule. And vendors displayed different enablers, including one based on Microsoft Corp.'s Windows announced last week by Cycle Corp. of Norwell, Mass.

"Application enabler" is a term for software products that employ graphical user interfaces, menus and icons to help nonpro-

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Briefs

Shearson IS to go commercial. Shearson Lehman Brothers, Inc. next month plans to spin off its information systems (IS) group into an independent business that sells data processing and networking services to Shearson Lehman and other users, according to John Lane, the company's executive vice-president and director of telecommunications.

Lane said control of the IS arm will be shifted from Shearson Lehman to parent American Express Co.'s Information Services Co. (ISC), which owns seven other business units that supply credit card processing and other information services to such companies as American Express. The Shearson IS arm will be renamed the Securities Information Group of ISC.

IBM cuts RISC System/6000 prices. IBM last week introduced new software that improves the performance of its RISC System/6000 workstations and servers. It also announced price cuts of up to 60% for some RISC System/6000 servers. The price decreases apply to the RS/6000 Powerstation and Powerserver 520, 530 and 550; the Powerserver 930 and 950 rack-mountable systems; and the Powerstation 730 Supergraphics workstation. The cuts for base configurations, including memory and disk storage, range from 4% for the Model 930 to 60% for the 550. With the performance improvements added to the equation, the cuts range from 12% to 60%, IBM said.

The performance improvements, which are targeted at the scientific and engineering community, are attributed to a new compiler for applications written in FORTRAN. According to specifications developed by the Systems Performance Evaluation Cooperative, the performance improvements range from 27% to 52%.

Vendors serve up SMDS interface. A consortium of internetworking and wide-area networking vendors today will unveil a standards-based interface for linking local-area networks to Switched Multimegabit Data Service (SMDS) networks. The group is positioning the interface as a potential de facto standard for linking bridge/routers from any vendor to SMDS networks via any vendor's data service unit/channel service unit (DSU/CSU). Advanced Computer Communications, Digital Link Corp., Ungermann-Bass, Inc., Verilink Corp. and Wellfleet Communications are backing the interface.

No laughing matter. Pan American Satellite Corp. (PANAMSAT), a provider of international satellite-based network services, last week ran an eye-catching advertisement in *The New York Times* urging President Bush to lift a ban that restricts PANAMSAT from directly linking to the U.S. public switched network. PANAMSAT is seeking more freedom to compete with the International Telecommunications Satellite Organization, a global satellite cartel whose U.S. representative, Communications Satellite Corp., is allowed to connect to the public switched net.

The Bush administration is expected to make a decision on the public switched network restriction by the end of the month.

PANAMSAT's ad, a cartoon strip featuring a wisecracking, urinating dog, blasted the administration for "coddling obsolete monopolies like COMSAT/INTELSAT." The ad was turned down by several newspapers that deemed it to be in poor taste. A COMSAT spokesman called the ad "silly, childish and inaccurate," while the U.S. Department of State issued a curt "no comment."

GSA halts portion of FTS 2000 net. At Congress' urging, the General Services Administration last week temporarily halted an award to US Sprint Communications Co. to supply the U.S. Navy with telecommunications services under the giant Federal Telecommunications System (FTS) 2000 contract. Although the GSA's move is designed to quell congressional concerns about possible FTS 2000 contract improprieties, by GSA's own account, it throws the Navy's network plans into a state of disarray and may result in hundreds of thousands of dollars in new expenses to the government. It could also invite a possible lawsuit from US Sprint.

GSA Administrator Richard Austin said the Navy portion of the contract will be put on hold until the post of assistant administrator for FTS 2000 is filled. It would then be up to the assistant administrator to determine whether to reverse the GSA decision to assign the contract portion to US Sprint.

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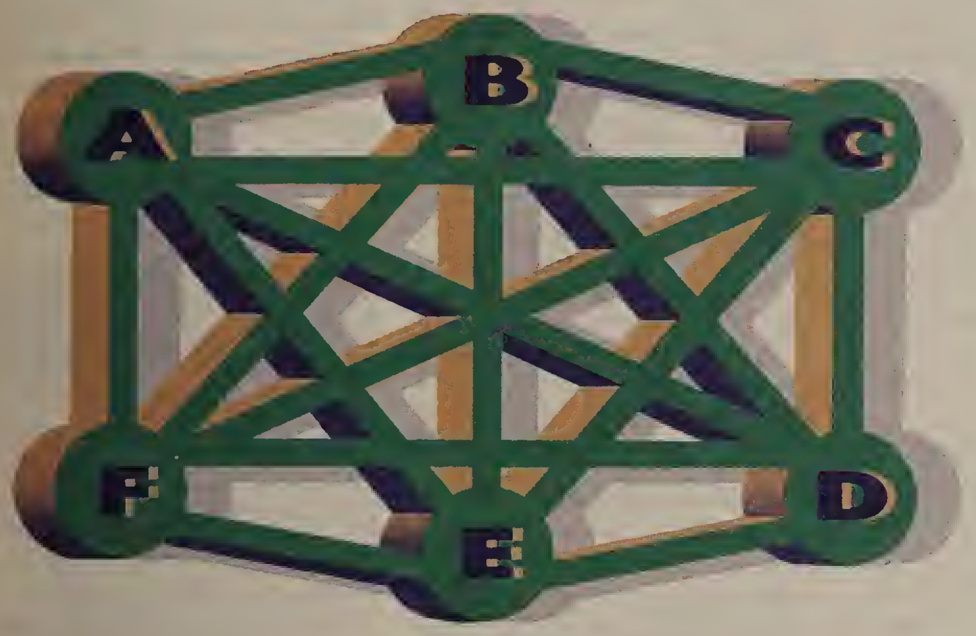
Traditional LAN Internetwork



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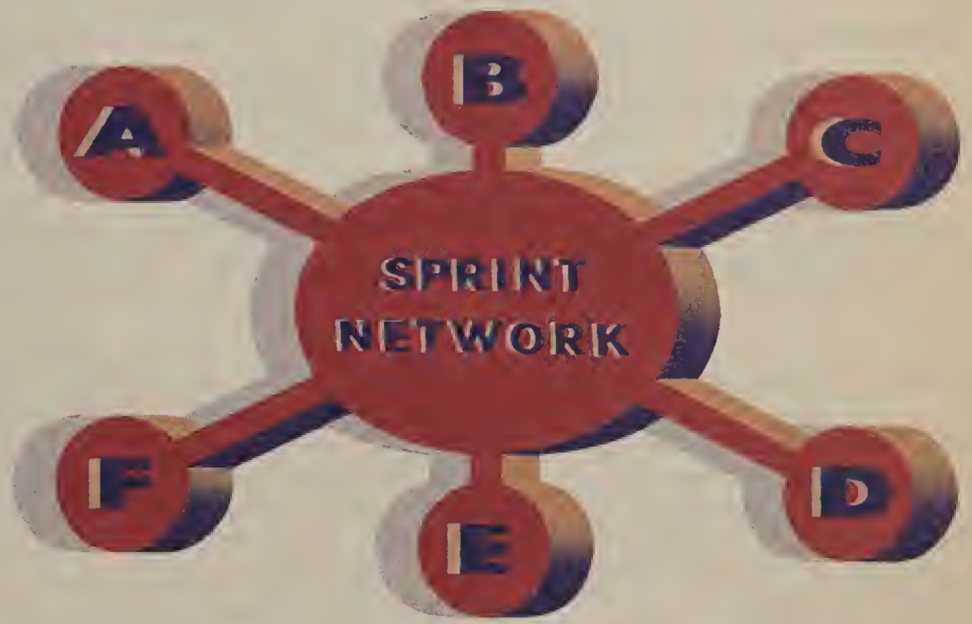

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N.Y. Tel proposes service to safeguard switched calls

Offering would send calls through secondary COs.

By Wayne Eckerson
Senior Editor

NEW YORK — New York Telephone Co. this week is expected to propose an alternative routing service for switched traffic in response to the disaster recovery needs of some of its largest customers.

The new service, dubbed Flexpath Digital PBX Service, will make it possible for users to receive incoming switched voice calls even if an outage occurs in their primary New York Telephone serving office.

> The tariff is the first of its kind to be offered by any local exchange carrier.
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The tariff, submitted to the New York Public Service Commission for review, is the first of its kind to be offered by any local exchange carrier, according to New York Telephone officials.

"We have been pushing New York Telephone [to offer such a tariff] because [their central offices] are a bottleneck on inbound switched voice services," said Edward Regan, vice-president at Manufacturers Hanover Corp. and former chairman of the New York Clearing House's (NYCH) telecommunications committee.

Regan, speaking here at The Financial Networks Conference, cosponsored by *Network World* and Digital Consulting, Inc., said the NYCH telecommunications committee worked closely with New York Telephone to craft the tariff.

While many financial services firms in New York have already established diverse routing for their private-line traffic by using alternative local exchange carrier services, they have been unable to protect against outages in New York Telephone's switched network, Regan said.

This has been a cause for concern among companies that want to maintain a high standard of customer service or that generate revenue from telephone orders.

The Flexpath service follows on the heels of a similar service for private lines that took effect in March. That service, known as Alternate Service Wire Center, provides private-line users with diverse routing to dual central offices. New York Telephone expects to tariff a service called Intellipath II sometime this summer that would provide diverse routing for digital Centrex users.

Under Flexpath, users with digital private branch exchanges can lease one or more dedicated circuits, such as a T-1, from their facility to an alternative central office designated by New York Telephone.

Users can allocate channels on these circuits for inward or outward calls, depending on their needs. New York Telephone will send a certain percentage of incoming calls through the alternative central office to continually test the backup route.

Should an outage take down the user's primary central office, New York Telephone will automatically reroute switched calls

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Racal Data fuses disparate products into nodal device

The Multifunction Communications System merges multiplexing, circuit/packet switching, LAN support.

By Jim Brown
Senior Editor

SUNRISE, Fla. — Racal Data Communications last week introduced a network system that can be used to meld into one unit several of the company's standalone products, including devices that support T-1 multiplexing, circuit switching, packet switching, and local-area network bridging and routing.

Besides sharing a common cabinet, the system enables users to more easily interconnect disparate products and provide for unified network management, obviating the need for separate tools.

The Multifunction Communications System (MCS) combines customized versions of Racal Data Communications' products, including its Omnimux 8000 T-1 multiplexer with circuit switching and digital access and cross-connect system capabilities, and its Racalan NetExpress LAN bridge and router.

These and other components are housed in a common cabinet and cabled to a 10M bit/sec Ethernet system bus. All components can be managed by the Communications Management Series (CMS) 400, an element management system that enables users to monitor and control devices from a single workstation. The CMS 400 can be linked to IBM's host-based NetView via CMS View, a bidirectional NetView/PC interface.

> "Basically, [MCS is] a soup-to-nuts Racal solution," Rick Malone said.
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Analysts said MCS represents Racal Data Communications' first attempt to merge internally developed modem and multiplexer products with multiplexers acquired from Communications Associates, Inc., LAN products obtained from InterLan, Inc. and fiber-optic products acquired from Quanta Communications Systems, Inc.

"Basically, it's a soup-to-nuts Racal solution with bridges, routers, T-1 multiplexing, statistical multiplexing and network management all tied together," said Rick Malone, a principal with Vertical Systems Group.

In the future, Racal Data Communications will upgrade the basic MCS platform from the 10M bit/sec Ethernet backplane to one based on fast packet switching technology that uses an Asynchronous Transfer Mode bus to move data between modules.

The company claims to already have designed a 512M and a 1G bit/sec Asynchronous Transfer Mode bus and is now working to build an interface that will enable T-1 multiplexing, LAN routing and other cards to plug into slots on the bus.

The Asynchronous Transfer Mode bus will enable MCS to support many more devices and provide the underpinnings needed to support advanced network ser-

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Network Systems to buy Vitalink for internet push

By Bob Brown
Senior Editor

MINNEAPOLIS — In an effort to bolster its presence in the internetworking market, Network Systems Corp. last week announced plans to acquire remote bridge market leader Vitalink Communications Corp. for about $146 million in cash.

Network Systems Corp.

Based: Minneapolis

1990 financials:
Revenue: $163.6 million
Earnings: $21.9 million

Primary products:
Hyperchannel-DX host-to-host LAN links and channel extenders, as well as Series 6000 bridge/routers

Under the agreement, Vitalink will operate as a business unit of Network Systems, overseeing consolidation and future development of both companies' internetworking products.

Network Systems promises to offer users a broad mix of internetworking offerings, including Vitalink's TransLAN bridges and TransPath bridge/routers, as well as the 6000 series of bridge/routers that Network Systems announced earlier this year ("Net Systems to intro bridge/router line," *NW*, Jan. 28).

Industry observers said the deal could broaden Network Systems' and Vitalink's market appeal by expanding both companies' stable of offerings.

The strength of Network Systems, based here, lies in its Hyperchannel-DX product line, which includes high-speed host-to-host connectivity products and channel extenders.

The company, which recently bolstered its Hyperchannel-DX products with new bridge/routers, reported 1990 revenue of $163.6 million and earnings of $21.9 million.

Vitalink
Communications Corp.

Based: Fremont, Calif.

1990 financials:
Revenue: $66.8 million
Earnings: $13.3 million

Primary products:
TransLAN bridges, TransPath bridge/routers and WANmanager network management system

Fremont, Calif.-based Vitalink owns about one-third of the installed base of remote bridges but lost momentum in the overall internetworking market due to its late entry into the multiprotocol router field. Vitalink posted 1990 revenue of $66.8 million and net

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Novell forms support team alliance with 11 vendors

By Caryn Gillooly
Senior Editor

PROVO, Utah — Novell, Inc. last week announced that it has signed technical support agreements with 11 vendors, forming its Technical Support Alliance (TSA).

Through the TSA, Novell will cross-train its technical staff and exchange products and technological information with member companies in an effort to help customers who call with problems, regardless of which vendors' product is the source.

The firms involved are Apple Computer, Inc., Borland International, Inc., Compaq Computer Corp., Hewlett-Packard Co., IBM, Intel Corp., Microsoft Corp., NetFRAME Systems, Inc., Oracle Corp., Ungermann-Bass, Inc. and 3Com Corp.

According to analysts, this announcement will alleviate much of the finger-pointing involved in local-area network support.

It is not uncommon, for example, for a user to call about a network interface problem, only to be told by the vendor that the trouble probably concerns the operating system. The software vendor might then say, however, that the problem concerns the application.

With TSA, customers would ideally only have to make one call, while the vendors would work behind the scenes to resolve the problem.

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FCC to open bypass options

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cision will benefit users by driving down prices and providing new options for backup and disaster recovery facilities.

"What this allows us to do is provide a competitive alternative to every special access circuit in the LATA," said Royce Holland, president and chief executive officer of Metropolitan Fiber Systems, Inc. (MFS).

"It would be a real anomaly if this doesn't produce the same effects as competition in the central business district," Holland said, adding that competition in some cities has caused local carriers to drop special access rates by as much as 50%.

The FCC's proposal last week was prompted by a petition filed in November 1989 by MFS, based in Oak Brook, Ill.

The company asked the FCC to force the regional Bell holding companies to allow collocation of rivals' equipment and to open switched access services to competition.

Important step

By mandating collocation of rivals' equipment, the FCC took a significant step toward greater competition in the local loop since the move opens up the entire $5 billion special access market to rival carriers.

Alternative carriers now typically serve only limited portions of downtown business districts and, consequently, have captured only 0.5% of special access revenues.

But the FCC stopped short of completely dismantling the RBHCs' monopoly hold on the local loop by deciding to take more time to study MFS' request to open switched access services to competition.

By providing switched access, rivals would be able to compete for virtually all business customers, whereas now they are limited to providing access only for high-capacity private lines.

This mirrors regulatory decisions at the state level, where some public service commissions have ordered collocation of equipment for intrastate special access but have not taken up the issue of competition for intrastate switched access.

Last week, Teleport Communications Group, an alternative services provider based in New York, struck a deal with Pacific Bell to collocate equipment in that carrier's central offices in San Francisco.

Teleport and MFS are also working on collocation agreements with Illinois Bell Telephone Co.; and last week, New York state regulators ordered New York Telephone Co. to upgrade from virtual to physical the collocation it currently offers to alternative carriers.

Allowing competition for switched access is more controversial and problematic for regulators because the service is provided for a much wider range of customers, including small businesses and residential users.

Considering affordability

FCC Chairman Alfred Sikes acknowledged last week that one of the major considerations in deciding whether to allow competition for switched access is whether it could threaten affordable service for smaller users.

"We want to take into consideration the historical price distortions of the local exchange carriers' access services," he said.

Although they were disappointed that the FCC resolved to delay a decision on switched access, officials from alternative access providers said the collocation decision was significant.

Competition in the local loop "is the kind of thing that comes in steps, and every step is important," said Robert Atkinson, senior vice-president for regulatory and external affairs at Teleport.

MHS' Holland agreed that the collocation decision will have a significant impact on his firm.

He said that even though MHS will have to wait on the switched access decision, the company had gotten more than half a loaf.

Holland said his firm is already rolling out two new services in New York made possible by collocation. ⧉

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AT&T buys NCR to anchor unit

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emerge will be uniquely equipped to meet what customers will need in the future — global computer networks as easy to use and as accessible as the telephone network is today,'' Allen said.

Industry observers said network managers may not begin to see the impact of the deal for many months, but if AT&T can exploit NCR's strengths, the carrier should be able to win over new customers and better serve its current user base.

Users and analysts reacting to the acquisition said AT&T needs to marry its telecommunications expertise with NCR computers to make it easier to use computers, automated teller machines, point-of-sale (POS) terminals and other networked devices.

''The promise here is that AT&T will be able to provide true end-to-end net services and applications,'' said Don Rees, vice-president of telecommunications at First National Bank of Maryland in Baltimore.

Rees said he believes the acquisition will fix AT&T firmly in the market for network-based retail and financial transaction processing applications.

''I would hope AT&T could bring improved net management and surveillance to the transaction processing market,'' he said. ''That would make their transaction-oriented services truly end to end.''

Jeffrey Fritz, a telecommunications engineer at West Virginia University in Morgantown, said one possibility would be for the vendor to equip computers with RJ-45 interfaces that would allow them to be attached directly to a telephone net.

Kerry Overlan, director of telecommunications for COM/Energy Services Co. in Cambridge, Mass., said the possibility of buying network services, computers, and voice and data communications gear from a single source is attractive.

Although AT&T is currently prohibited from bundling services and equipment, Overlan noted that ''regulations on AT&T are becoming less restrictive. I'm sure AT&T has this in mind.''

Kevin O'Neill, vice-president of network research and consulting at Business Research Group in Newton, Mass., said users should not expect the AT&T/NCR merger to pay dividends overnight.

''AT&T is building a whole new strategic infrastructure for the computer side of its business, and it may take years to see the results,'' he said. ''AT&T is willing to take a Japanese-style approach to making a long-term investment without feeling they have to cost-justify it immediately.''

O'Neill suggested that ATMs and POS systems could be expanded to serve markets other than traditional banking and retail industries. He said there is no reason why ATM-type transaction kiosks could not be placed in any number of vertical-industry settings.

''The key is that you have the public network tying the ATMs together, and that's where AT&T can play,'' O'Neill said. ''NCR has the technical knowledge and computer network expertise for building these kiosks and ruggedizing them for different situations.''

AT&T pointed to the services it is providing to Huntington National Bank of Columbus, Ohio, as an example of the type of integration it hopes to provide. Huntington National has merged videoconferencing and data base access with ATMs to give its customers access to new on-line services, such as loan processing and investment counseling.

If AT&T can exploit NCR's strengths, the carrier should be able to win over new customers and better serve its user base.

▲▲▲

Steve Muzzo, chief executive officer for Wellmark, Inc., a Westlake Village, Calif., subsidiary of Primark Corp., said he already understands AT&T's vision of networked computing.

Wellmark, which provides processing of insurance claims and other data to health care operations, recently signed a multimillion-dollar contract with AT&T Computer Systems for a variety of computer products.

The company's Well-Net health information network in California, which is being expanded to other parts of the country, links AT&T workstations running proprietary Wellmark software at hospitals, doctor's offices and clinics to an AT&T System 7000 multiprocessing server at Wellmark's headquarters via AT&T's public switched packet net.

''In our case, the computers and network have been married,'' Muzzo said.

But not all users — even some large AT&T and NCR customers — have a clear vision of how AT&T's acquisition of NCR will benefit customers.

''This is a good move for AT&T that overnight will make it a strong player in retail and financial markets, as well as internationally,'' said David Evans, vice-president and director of information systems at J.C. Penney Company, Inc., an AT&T Tariff 12 customer and a large user of NCR POS terminals and computers. ''AT&T may have a vision beyond that, but I can't claim to have it or understand it.'' ⧉

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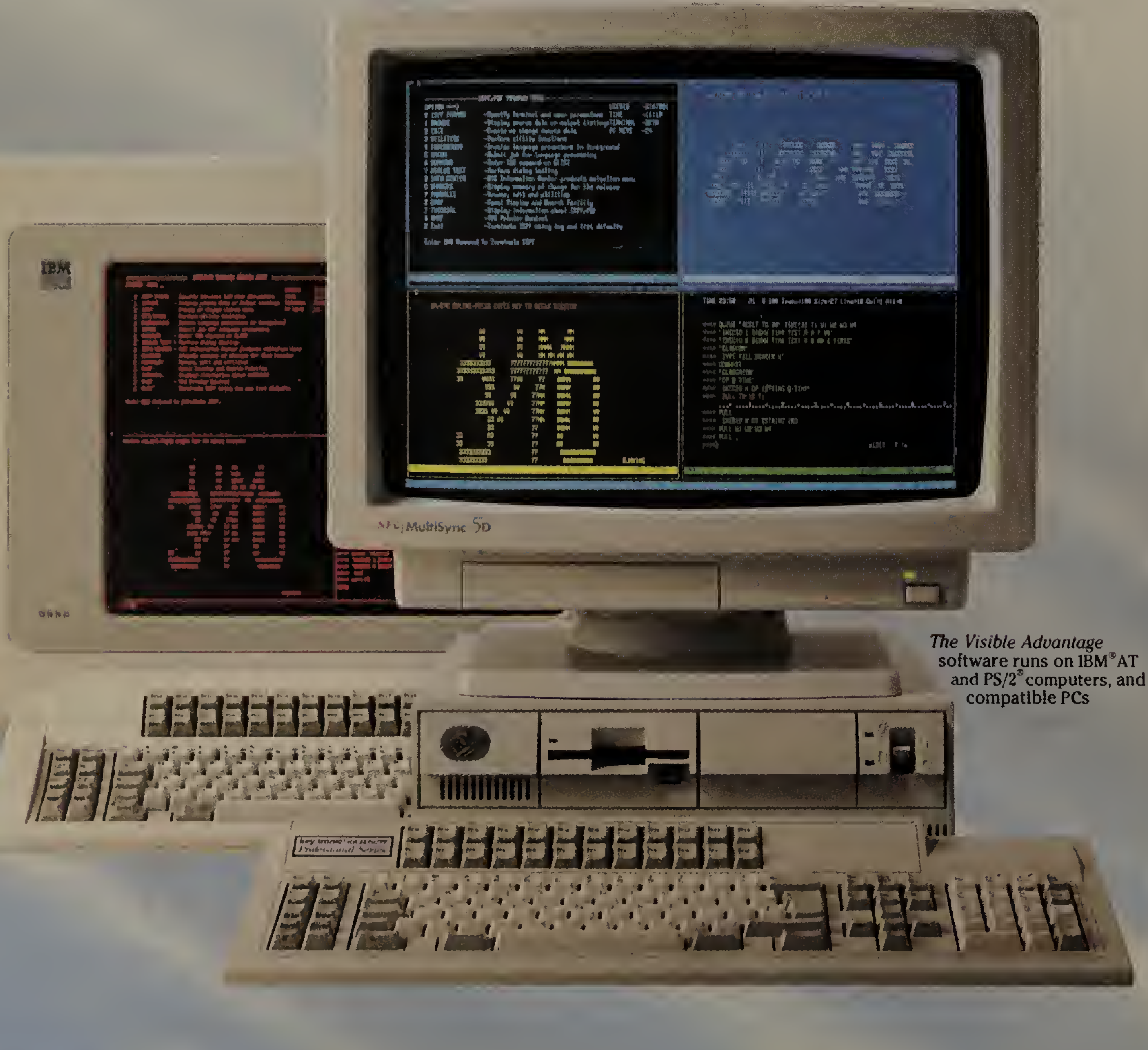

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

The Department of Commerce recently reported that the U.S. trade deficit in telecommunications equipment fell to $792 million in 1990 from $1.9 billion in 1989. Reasons for the turnaround include the weaker dollar and a reduction in foreign trade barriers.

People & Positions

Smart hub maker **Luxcom, Inc.** of Fremont, Calif., recently named **John Blokker,** formerly vice-president and general manager of Hewlett-Packard Co., president and chief executive officer of Luxcom. One of his new duties will be to focus on developing Luxcom's technology relationship with Ericsson Business Communications of Sweden.

Nynex Corp. last week announced that **Salvatore Alini** has been named managing director for data networking services at the carrier's New York Telephone Co. and New England Telephone and Telegraph Co. subsidiaries.

Alini will be responsible for development of the telephone companies' data communications business. He formerly was vice-president and general manager of Concurrent Computer Corp.

PictureTel Corp., a Peabody, Mass.-based maker of videoconferencing equipment, last week announced the appointment of **Timothy Duffy** as managing director of European, Middle Eastern and African Operations. Duffy will be responsible for sales, marketing, service and support activities in those regions. Duffy was formerly director of GEC Plessey Telecommunications. ☐

Signs point to rising value of image nets at user sites

Users plan to deploy nets on enterprise scale.

By Caryn Gillooly
Senior Editor

WASHINGTON, D.C. — The recent arrival of advanced network-based imaging products and indications from current users that they plan to deploy imaging on an enterprisewide scale are proof that the nascent market is rapidly maturing, analysts said last week.

Although network-based imaging products still pose many obstacles for companies that install them, users are rapidly snapping up new products. They are also demanding — and getting — a new wave of imaging products capable of ushering work through a network from inception to completion.

According to a study by BIS Strategic Decisions, a Norwell, Mass., market researcher, the North American image management systems market is expected to grow from its current annual $911 million mark to more than $12 billion by 1995, a 72% compound annual growth rate.

This growth estimate is backed by user installations. According to BIS Strategic Decisions, 74% of the nearly 150 imaging users surveyed had installed systems in 1989 or 1990 vs. only 15% that had installed systems in 1988.

These users are satisfied and will continue to grow their systems, according to Roger Sullivan, vice-president of information management systems at BIS Strategic Decisions. In fact, about 85% of the survey respondents said they will expand their current systems. Of those, 80% said they are now in the process of expanding or will expand sometime this year.

The study also found that imaging will likely grow to enterprisewide proportions. Although most imaging systems are now being used primarily for departmental applications, BIS Strategic Decisions said 92% of the survey respondents plan to incorporate imaging as a part of their corporate architecture by 1995.

Another indication that the market is maturing is recent product introductions that suggest users are asking vendors to deliver advanced applications.

"At this year's [1991 Association for Information and Image Management Conference and Ex-

(continued on page 10)

INDUSTRY BRIEFS

Intel acquires LAN vendor. Intel Corp. last week said it has acquired the assets of LANSystems, Inc.'s Network Products Division, including its LANSpool print server software, as well as its software development team, sales and marketing group, and management team. Terms of the agreement were not disclosed. The acquisition will bolster Intel's existing offerings, including its NetPort series of print servers. The LANSystems products will be sold via Intel's reseller channels.

Tyrone Pike, former LANSystems president and chief executive officer, will join Intel as manager of the network enhancement utilities business unit within the company's Personal Computer Enhancements Division. The acquisition does not include LANSystems' New York-based systems integration business, which will remain a privately held company.

PacBell to market Ungermann-Bass hubs. Pacific Bell's Data Communications Group last week announced that it will offer Ungermann-Bass, Inc.'s Access/One series of intelligent wiring hubs and related products under a joint marketing agreement. As part of the pact, Ungermann-Bass will train Pacific Bell's sales force on its Access/One product line. Also, it will provide support to customers signed onto Pacific Bell's Enhanced Service contract, under which Pacific Bell acts as the customer's sole point of contact.

Systems Center, Andersen Consulting partner. Systems Center, Inc., based in Reston, Va., recently announced a strategic alliance with Andersen Consulting to jointly pursue systems management projects.

(continued on page 65)

X.500 meeting draws a crowd

Attendees at the North American Directory Forum's March gathering

Vendors

AT&T
Bell Atlantic Corp.
Bell Communications Research
BT North America, Inc.
GE Information Services
IBM
Infonet Services Corp.
MCI Communications Corp.
Pacific Bell
Performance Systems International, Inc.
Southwestern Bell Corp.
Sprint International
U.S. Postal Service

Users

The Boeing Co.
British Petroleum Co., p.l.c.
Exxon Corp.
General Electric Co.
NASA
Westinghouse Electric Corp.

Users attending the meeting were invited by vendors; they are not forum members.

GRAPHIC BY SUSAN J. CHAMPENEY SOURCE: US SPRINT COMMUNICATIONS CO., WASHINGTON, D.C.

Forum to announce common X.500 plan

NADF members strive to offer interconnected X.500 directory services on public data networks.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — Members of the North American Directory Forum last week said the group will unveil in July a proposed plan to implement uniform directory services on their public data networks.

By standardizing on a single X.500 implementation, forum members — mostly public electronic mail and X.25 service providers — will provide subscribers with comprehensive directory services that will enable them to query on-line data bases and determine the network addresses of users or companies across interconnected public X.400 nets anywhere in North America.

But already, some users have expressed concern about interfacing their private directory listings with public networks in the absence of adequate security safeguards.

The X.500 Open Systems Interconnection standard for Directory Services is the foundation upon which public E-mail providers will build their new routing directories, eventually abandoning proprietary systems.

X.500 was created to support a global directory in which any E-mail user would have access to public network data bases compiled similarly to the white and yellow pages offered by local carriers today.

When a user issues a query to locate the address of a person at another company, a Directory System Agent within the X.500 directories initiates a search through distributed data bases until the desired information is located and retrieved.

Forum members reached a milestone last March by striking technical agreements on the naming schemes, querying mechanisms and complex interexchange of data needed to support the X.500 standard as a common service.

The next step is implementation, said Gary Rowe, director of core services marketing at AT&T EasyLink Services and a forum delegate. He is additionally charged with designing a time frame for the forum's implementation of X.500.

Gary Rowe

"One of the first things we want to do in a real-world environment is take a couple of vendors and set up a pilot," Rowe said, pointing to the next likely move by the forum.

When used to create a white pages directory service, X.500

(continued on page 10)

Signs point to rising value of image nets

continued from page 9

position] show, there was less hype and more substance," said Bruce Silver, director of image management at BIS Strategic Decisions. "This is a sure sign the market is maturing."

Even the theme of the recent AIIM show was evidence that the market has shifted to delivering more sophisticated applications. Silver said vendors pushed the concept of work-flow technology.

"Work flow is software that moves work, or images, around from person to person automatically," Silver said. It can make decisions about where to send information next, for instance, dividing work between employees so one person is not swamped while another has little to do.

Before this year, Silver said, more complex tools such as work-flow tools had been missing from the AIIM show — and the imaging market in general. This year, almost every vendor demonstrated tools that let users create their own applications and even simulate environments to get the best work-flow performance.

Analysts warned, however, that the market will not fully mature any time soon. They also said users will face difficulties such as decentralized information and incompatible systems when implementing enterprisewide imaging.

Silver said he sees a vacuum in personal computer local-area network imaging. "Most rich, robust products tend to be at the high end, for Unix server- and minicomputer-based environments," he said.

"For PC LAN systems, I'm disappointed that there's not more out there," Silver said. "A system in the $50,000 range for five to six workstations is the missing element." The average cost of an imaging system today is about $800,000.

The reason for the lack of low-end products is because primary image management vendors are concentrating on providing the core technology and expect third-party vendors to write the lower end applications, he said. With market maturation, those third-party applications will begin appearing fairly soon. ◼

Forum to announce common X.500 plan

continued from page 9

will provide the user's E-mail address, phone and facsimile numbers, and home or business address. A subsequent Yellow Pages service could provide storage of advertising and mailing lists, said Ted Myer, forum cochairman and president of consulting firm Rapport Communications.

"This standard is probably the most ambitious ever put in place," he said. "What's unknown at this point is to what extent graphics and voice messages could be encoded in the directory."

Another unknown facing public X.500 usage is the extent to which private corporations will interface their internal X.500 directories with public directories — and exactly how that access control will be established.

User concerns

Even though X.500 can provide universal access, some users have made it clear to the forum that they do not want unauthorized individuals accessing their directories through a public X.500 directory.

The forum last March invited several large users to its meeting to hear their views on the issue (see graphic, page 9).

"One of the things that was very clear is private companies are not going to make their user base known to the world," said Upendra Gupta, manager of marketing programs at US Sprint Communications Co. "However, all of these customers are ready to make a subset of their user base available."

Many companies want their marketing and sales staff to have high visibility to the outside world but would prefer to keep private detailed information on such personnel as engineers and executives, Gupta said.

"There are a lot of concerns we have about how open we want to make our directory," said Roger Mizumori, manager of messaging architecture at The Boeing Co., a strong advocate of X.500. He explained that job recruiting or junk mail could become problem areas without adequate X.500 privacy mechanisms.

Public net service providers now face the problem of putting in place the appropriate security and access mechanisms, AT&T's Rowe said.

According to Myer, the 1992 version of the X.500 standard will have more security features than the current 1988 X.500 standard.

"By 1992, the standard will provide a full set of access control tools," which will permit service providers to determine who can access any piece of information, he said.

Although Boeing prefers the security features of the 1992 version, Mizumori said the company is reluctant to wait until then and is now investigating how it might use the 1988 X.500 version despite the software's lack of access controls.

Myer said European standards groups will closely follow the forum's X.500 work primarily because they are looking to the forum to lead the efforts on interconnecting X.500 directories.

"We expect that when they put together a similar group, we will have a strong liaison," he said. "The long-term potential is a worldwide directory. If you want to locate a Peugeot dealer in Paris, you should be able to do it sitting in [Washington] D.C." ◼

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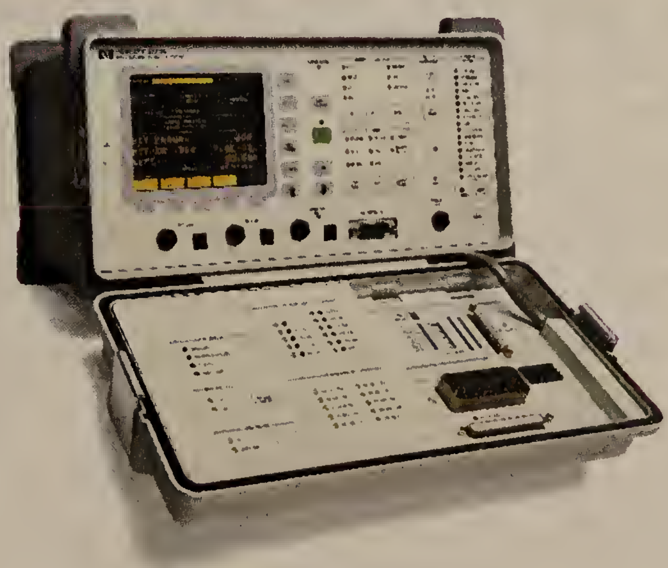

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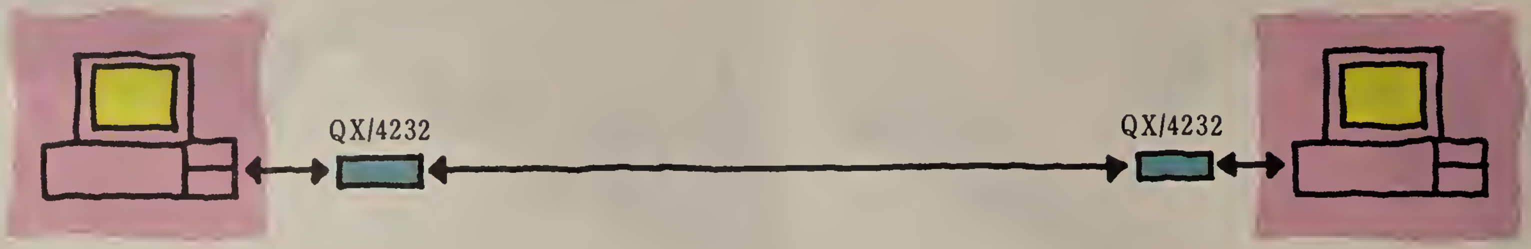

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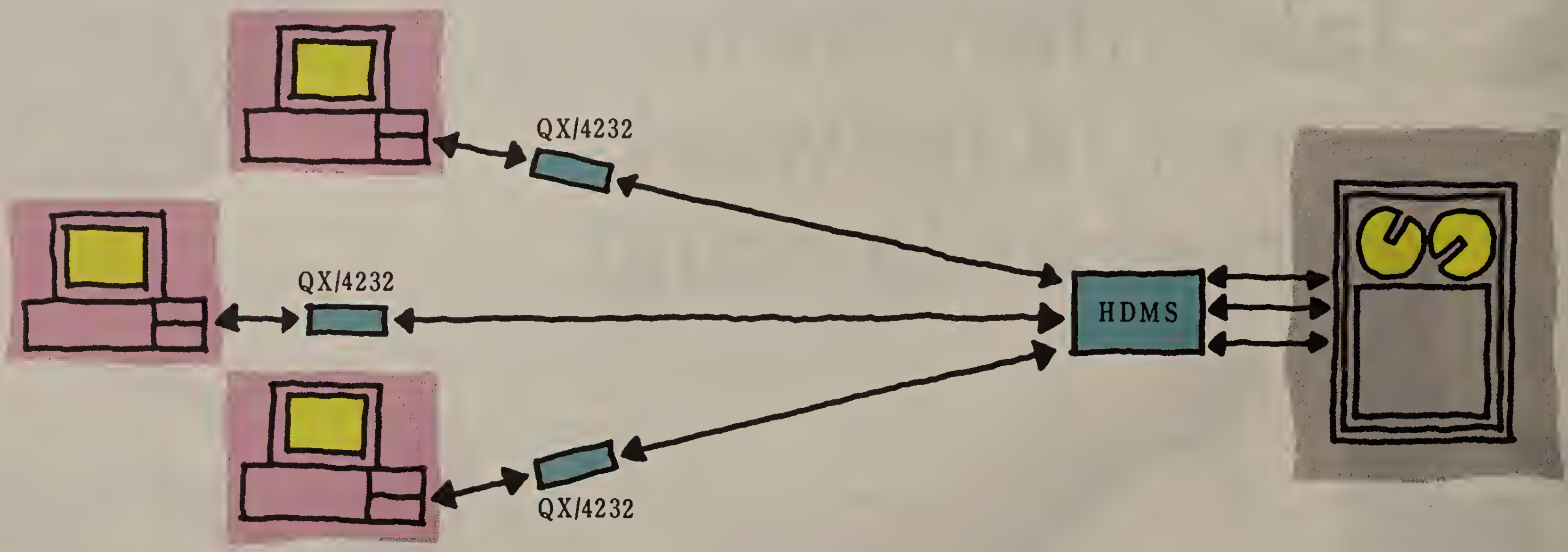

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TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

Worth Noting

Octel Communications Corp. led the voice-messaging industry with a 22% share of total market revenue in 1990, followed by AT&T with 16% and Northern Telecom, Inc. with 12%, according to a recent report by Hambrecht & Quist, Inc. in San Francisco.

Carrier Watch

Ohio Bell Telephone Co. recently announced a toll-free calling service that enables companies to use existing telephone lines to receive intralocal access and transport area 800 calls.

Designed primarily for small and midsize users, Custom 800 carries a onetime $19.25 installation charge and a $9 per-line monthly fee. Customers pay 18 cents a minute for incoming calls.

Custom 800 includes one free white pages listing in the Ohio Bell/Ameritech Publishing telephone directory of the customer's choice, provided it is within the same service area. Ohio Bell provides optional monthly call records with Custom 800.

Custom 800 is available in the Akron/Canton, Cleveland, Columbus, Dayton, Toledo and Youngstown service areas. Ohio Bell said it can provision Custom 800 in as few as one or two days after receiving an order.

Pacific Bell recently announced plans to sell Digital Sound Corp. voice-messaging systems to California businesses with 200 or more users, complementing the voice mail services it offers to firms with fewer users.

The voice-messaging systems are compatible with leading private branch exchanges and can be integrated with the switches to offer personalized telephone answering and mes-

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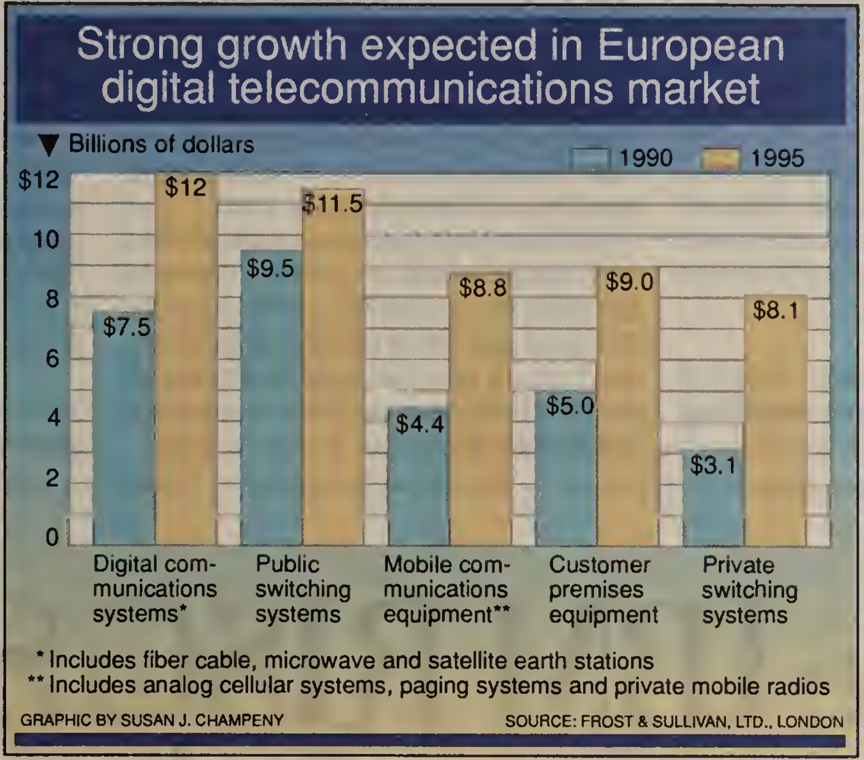
Strong growth expected in European digital telecommunications market

* Includes fiber cable, microwave and satellite earth stations
** Includes analog cellular systems, paging systems and private mobile radios

GRAPHIC BY SUSAN J. CHAMPENEY

SOURCE: FROST & SULLIVAN, LTD., LONDON

FCC faces Sept. deadline to wrap up Tariff 15 review

May also rule on Tariff 12 and AT&T dominance.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — FCC officials recently said they must wrap up their investigation of Tariff 15 by late September, a deadline by which the agency may also be forced to resolve proceedings on Tariff 12 and an AT&T market status study.

The Federal Communications Commission is under increasing pressure not only from user groups and AT&T, but also from Congress to resolve the issues and free customers from the cloud of legal uncertainty currently hovering over most major telecommunications issues.

> All three proceedings have a direct bearing on the types of services users get from AT&T.
>
> ▲▲▲

Both tariff investigations have dragged on for several years, and the examination of AT&T's market dominance celebrated its one-year anniversary in March.

All three FCC proceedings have a direct and significant bearing on the types of services users can obtain from AT&T and the hoops they must jump through to get them. Tariff 12 allows users to purchase integrated packages of various services, and Tariff 15 allows AT&T to offer discounted service to specific customers. The FCC's examination of AT&T's market status could result in a major overhaul and loosening of AT&T restrictions.

In the first public statement on the issue, Colleen Boothby, deputy chief of the Tariff Division of the FCC's Common Carrier Bureau, said the agency must complete its Tariff 15 investigation by Sept. 21. She told attendees at a telecommunications conference here that due to new rules instituted by Congress in 1990, "we must produce an order resolving that issue by then."

Those rules, prompted by congressional concerns that the FCC was dragging its feet, give the agency 15 months to resolve complex proceedings. That deadline will pass in September for the first Tariff 15 deal that took effect for Resorts Condominium International, Inc.

Tariff 15, since it allows AT&T to single out particular customers for deep discounts on existing services, has generated controversy because opponents claim it violates provisions of the Communications Act of 1934 forbidding carriers from discriminating among users.

AT&T contends that its competitors are cutting similar deals with customers and that if it is to compete effectively, AT&T must be allowed the same freedom.

Boothby said AT&T's Tariff 15 justification — a legal doctrine known as competitive necessity — has been used in the past by carriers to justify discounts for particular services but never to single out individual customers for special treatment.

(continued on page 30)

MCI exec outlines Vnet mart challenges

Vnet chief details carrier's strategy to entice small users to other services and limit third-party sales.

Q&A The runaway popularity of virtual networks among users, resellers and aggregators has forced MCI Communications Corp. and the other major carriers to take steps to control the use of their software-defined services.

MCI has worked to limit the sale of the service by third parties and has also tried to lure small and midsize users with less sophisticated calling needs to other offerings such as its Vision service.

John Crooks, director of Vnet marketing at MCI, recently discussed with *Network World* Senior Editor Bob Wallace the challenges he sees MCI facing in marketing the Vnet virtual network service and in supporting the more than 850 current customers of Vnet.

How fast has your Vnet customer base increased over the years?

Over the past year, the customer base has gone up 30% to 35% across the industry. Our growth is along the same lines. Of course, the volume is up as the industry continues to move to virtual networks.

For the most part, the Fortune 2,000 are either using a virtual network service or are planning to do so.

Although the functionality is superb, it's also the most eco-

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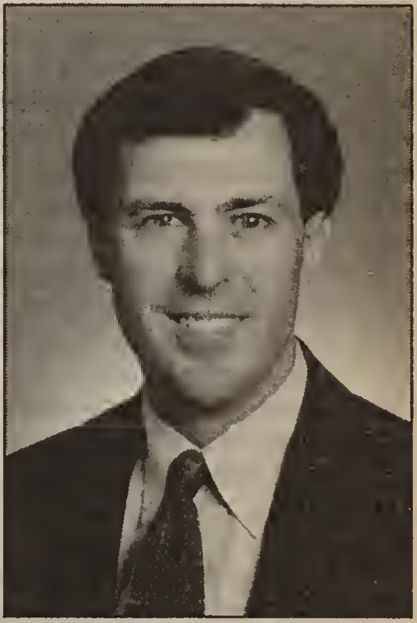
John Crooks

WASHINGTON UPDATE

BY ANITA TAFF

MCI blames losses on illegal AT&T tactics. MCI Communications Corp. recently told the Federal Communications Commission that it has lost at least $71 million over the last two years due to AT&T marketing activities it claims are illegal. The allegation concerns an inbound calling feature of AT&T's Software-Defined Network (SDN) known as Network Remote Access (NRA) Option III-Express that allows users to dial an 800 number from an off-network location and automatically complete the call over the SDN net at a predetermined on-network location.

MCI claims that in some cases customers have been able to switch their existing 800 number over to the NRA feature, thereby paying lower SDN rates for inbound service rather than 800 service rates. AT&T claims that the NRA Express option is not an 800 service but an access option for SDN customers. AT&T said it chose to use 800 numbers for the access only because it was the most economical technology available when NRA Express was introduced in April 1989.

MCI said this feature has proven irresistible to users, and the carrier claims that some have opted for AT&T's SDN service solely because they could get discounted 800 service as part of the deal. MCI filed a formal complaint in December, saying it is losing business due to the allegedly illegal feature and asked the FCC for compensatory damages. In its FCC filing late last month, MCI for the first time put a dollar value of $71 million on those losses, saying the figure does not include punitive damages or court costs.

(continued on page 15)

MCI exec outlines Vnet mart challenges

continued from page 13

nomical way to [handle] outbound voice and, increasingly, data and video. You are going to get to the point where [the installed base] is not going to increase as dramatically because you will have so many customers using virtual networks. While the number of customers won't increase as fast, use of the service will increase as companies utilize it for a larger percentage of their traffic. Today, they may be using it for 10%, 15% or 25% of their voice traffic. I see this increasing to between 75% and almost 100% in the next two years.

Where is Vnet headed as a service?

There's a major trend toward virtual network connectivity with evolving virtual networks overseas. That started last year and will continue this year. Vnet is extending its reach and capabilities to overseas locations. And there's the evolution of a switched data platform, which is evolving rapidly and will support switched data services here and overseas.

It started with switched 56K [bit/sec service] and will continue with switched 64K in the fourth quarter. Then it will move to higher levels — switched T-1 and T-3. It will take a short period of time to migrate those to the Vnet platform.

Are there any plans to add voice processing features to Vnet?

We don't have any specific plans to introduce voice processing as part of Vnet this year. But we'll be pretty active in offering those services in 1992. You can assume that what you see on 800 services will be added to Vnet.

Was Vnet ever intended to be used by small users with only a handful of sites?

One of the reasons virtual networks are so appealing is price. We recognize that Vnet is really a very complex product and requires a fairly comprehensive level of support and service.

It really doesn't lend itself to a single-site location where all the customer is looking for is price. That kind of customer doesn't need all the fancy features, documentation and special billing.

Rather than taking Vnet down to smaller locations, we are pushing Vision, which looks a lot like Vnet and is priced reasonably. [Vision] has enhanced services but is oriented more toward smaller customers with less comprehensive needs.

You'll continue to see Vnet positioned for large multinational companies that require a high level of support and services, and need a lot of flexibility and network management. These requirements are very demanding on our network, its intelligence and capacity. There will be other products that will give the economic incentives necessary to get the smaller, less sophisticated customers and single-site customers. Vision and Preferred represent the direction we're going in here.

But do you really see users moving to something like Vision if they are already on Vnet?

Down the road, we [could establish] some volume requirements that direct current users toward a different product.

We want customers to have the level of service they need. Whether its Vision or Preferred or some other product, you are beginning to see a tremendous level of sophistication we offer to small users. I wouldn't be surprised to see other carriers come out with Vision-like products.

We'll give smaller users features but on a different platform that allows us to bill and provision without gumming up a very complex and intelligent data base [system] that's necessary to meet the requirements of larger users with more sophisticated networking needs.

Can you quantify how large a group of companies are reselling Vnet?

No. We are concerned about reseller and aggregator use of Vnet. They want to take Vnet and sell it to a wide base of customers — be they consumer or small business — because of the price.

[Those customers] don't need a lot of the features and sophistication. We need to see if we can meet their needs with another type of product, if one is necessary. And we have to understand how we can migrate them to a different platform.

We have attempted to position Vnet very carefully and restrictively over the last year. We've seen some of the aggregators go to a different product. Right now, I don't have a good sense of how much aggregator business is out there or how many aggregators there are.

We know there's a tremendous failure rate among those businesses. For a while, aggregation was a quick, fast way to make money.

There are a lot of strong businesses out there that have done it, but there are also a lot of people who have gone out of business.

We are concerned about this and we want to be responsive. It's obviously a big business opportunity, but we don't want to have them reside on the Vnet platform if they don't need the features and the functionality that we offer to serve their [customers].

Is MCI considering something similar to AT&T's recently an-

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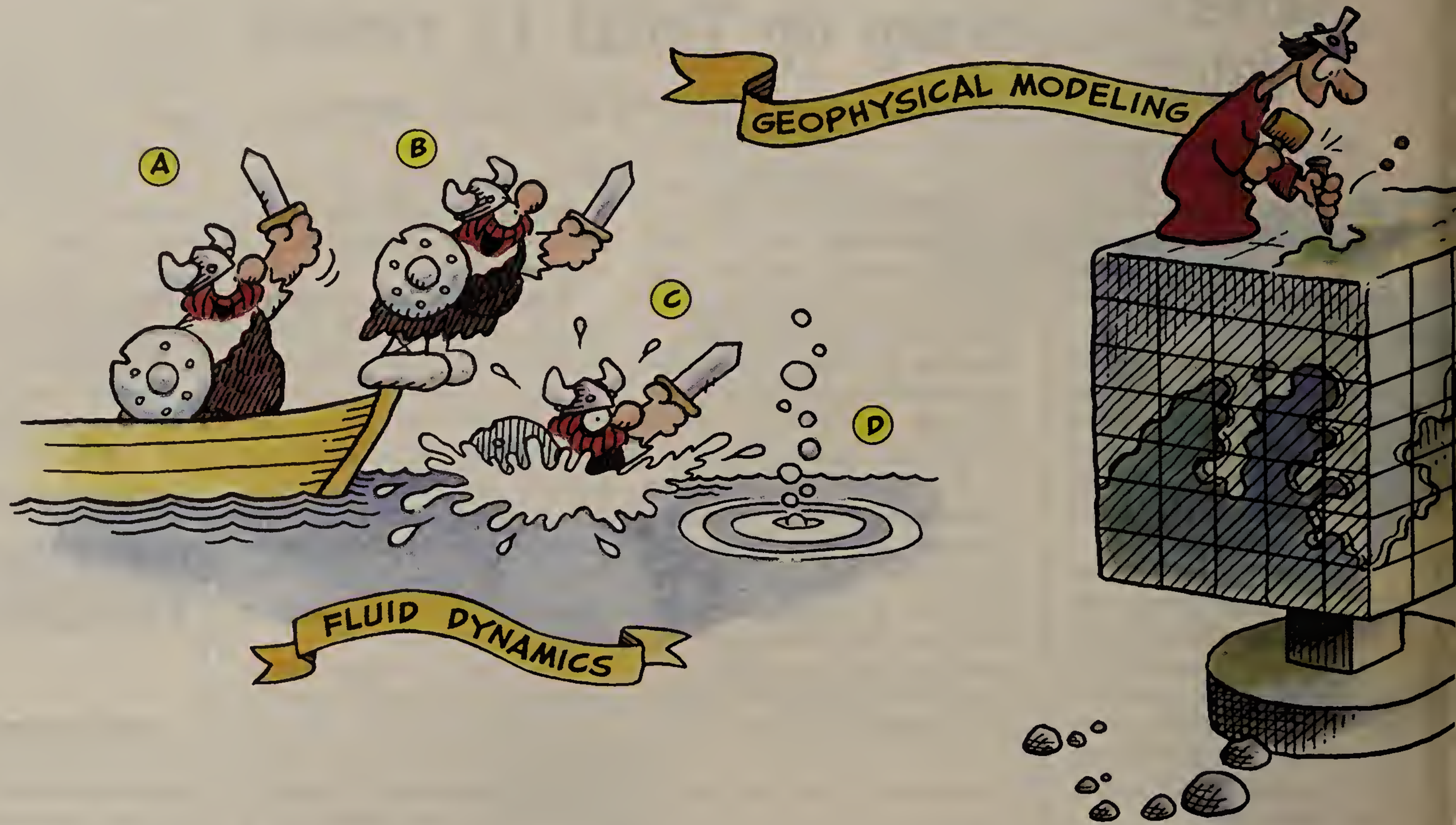

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nounced Distributed Network Service (DNS)?

We're watching DNS very closely. It's a possibility, but we want to see how successful AT&T is with it. They're trying to take high-end aggregators and move them off SDN and onto a product where they pay a higher rate per minute. It's unclear how they're going to do that and what the incentive is going to be.

I don't think we've heard the end of the DNS story. There may be some additional tariffing or pricing involving DNS and SDN that may prove what their strategy actually is. This may be just one in a series of moves that are going to be made.

We're not planning, at this point in time, to introduce a clone of that product. But, obviously, it's worth watching.

Shifting to another topic, what is the typical mix of dedicated and switched lines that customers use to access Vnet?

In general, the number of dedicated locations as a percentage of overall locations is around 10%. But it varies widely, depending on the type of business using Vnet. A retail user that may have 1,500 or 2,000 locations may only have a few dedicated access sites, whereas a large bank or insurance company may have eight to 10 dedicated sites and maybe only three or four switched access sites.

Why would a company use more than one virtual network service?

There is an increasing feeling among users that it's not a good idea to be completely locked into one carrier, whether its for voice or data.

Virtual networks are easy to set up, and the dialing plan can be the same [from one carrier to another]. It's easy for a company to use two or three virtual network products. This gives them diversity and redundancy.

> "There is a feeling among users that it's not a good idea to be completely locked into one carrier, whether for voice or data."

▲▲▲

There's been a feeling all along that many people want to know which virtual network service works better. In the eyes of some people, the only way to understand that is to set them up side by side, see how they come up, see how they are serviced, how they are partitioned, what the quality is, what the billing looks like and other criteria.

Then down the road, customers will decide to stay with two or feel that one provides a higher level of service or quality and go with that one.

How common is it for companies to use more than one virtual network?

Very common. You'll find a lot of companies that use more than one. It comes down to a company philosophy. With the [service] outages we've seen, more and more companies are getting gun-shy about making a full commitment to any one network.

If one network has a serious outage, you can lose an entire day's service. But it's relatively easy to guard against.

One way to maximize uptime is to make sure you've got a backup to all your facilities, including your virtual network. ◘

Washington Update

continued from page 13

It is unclear how the FCC will rule on MCI's complaint, but AT&T has previously come under fire for bundling its 800 service with SDN. In June 1990, the FCC rejected a proposed tariff in which AT&T would have offered a discount on combined SDN and 800 usage. The agency said AT&T is dominant in the 800 service market due to the nonportability of 800 numbers and AT&T's 80% share of the market. A combined discount would allow AT&T to leverage its market strength in one area in order to sell another service, the FCC said.

Tariff 15 deferred again. Under protest, AT&T last week deferred another of its Tariff 15 deals, this one for VoiceCom Systems, Inc. The deal would give VoiceCom a postalized usage charge of 8.5 cents per minute on AT&T's Megacom and Megacom 800 service whether the services are ordered individually or together. Three competitors have protested the deal with the FCC. The agency said it needs more time to study the legality of the VoiceCom deal and asked AT&T to defer the effective date to July 20. On that date, the FCC will have used the maximum 120 days allowed to review the filing. Prior to last year, the agency had only 90 days to examine tariff filings but Congress granted the FCC another month for its reviews.

In its filing last week, AT&T agreed to give the FCC the full 120 days but did so under protest. ◘

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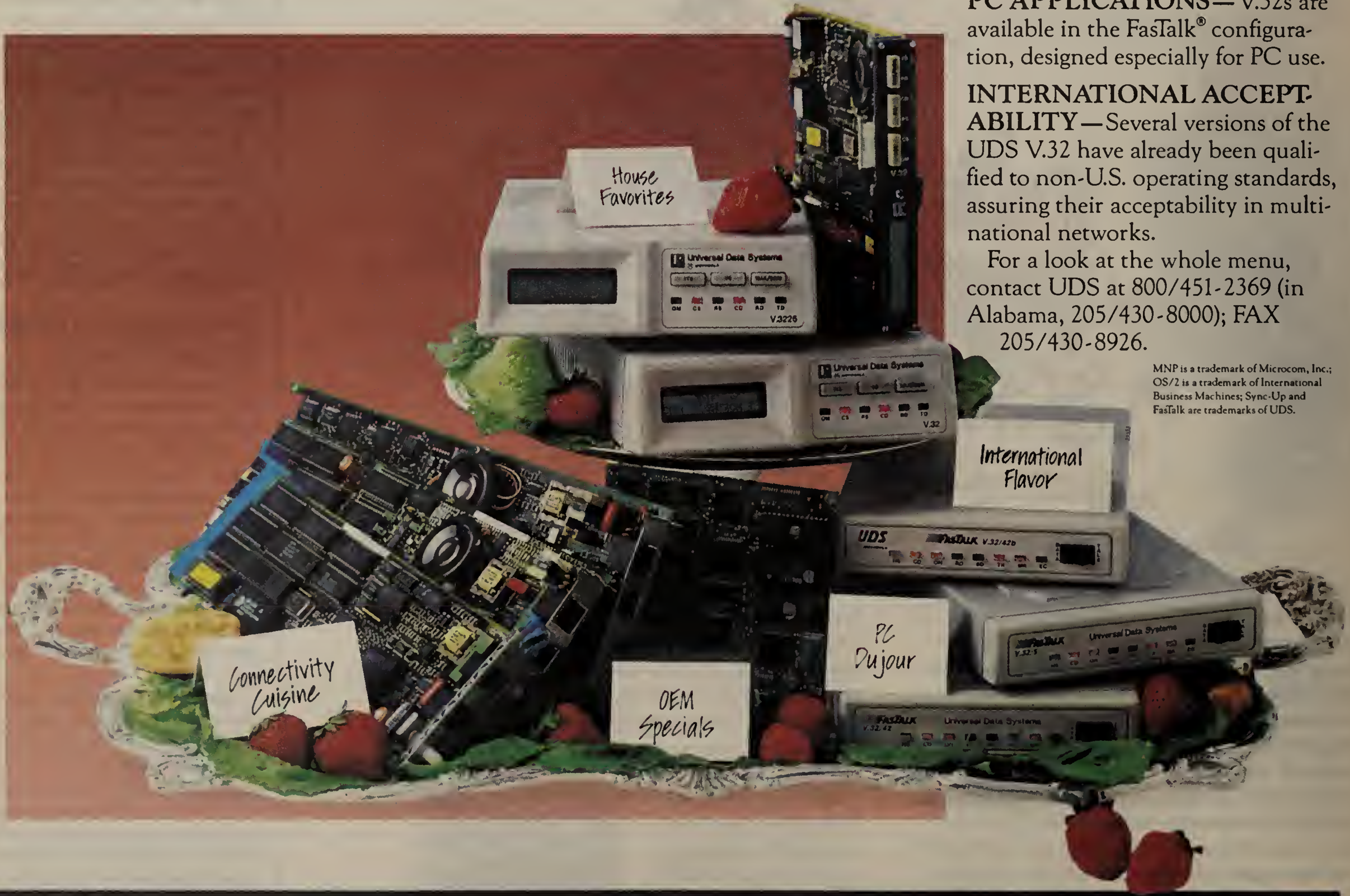

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

NCR Corp. last week opened a 10,000-sq.-ft. disaster recovery facility in Dayton, Ohio, that is equipped with NCR computers, front-end processors and other peripherals. The site also has multiplexers that enable users to reroute net traffic to Dayton when their data center fails.

Data Packets

Eastman Kodak Co. and Nynex Corp.'s research and development arm **Nynex Science and Technology** recently teamed up to develop applications that will enable users to transmit large files and images to remote copy machines or printers via Switched Multimegabit Data Service (SMDS) circuits.

The firms will develop a prototype application for demonstration at upcoming trade shows in which large document files can be transmitted over SMDS to remote copy machines and printers.

Eastman Kodak said an example of a potential application would enable a user to scan a technical reference manual into a central-site copy machine or print server that would then download digitized files via an SMDS link to a remote copy machine or printer.

The manual would be printed at the remote site, which would obviate the need for central-site staff to print and distribute the manual. The firms will also develop standards for transmitting digitized images via SMDS.

Soft-Switch, Inc. of Wayne, Pa., last week said value-added network service providers Graphnet, Inc. and Infonet Services Corp. as well as software vendor WordPerfect

(continued on page 20)

Chrysler extols benefits of move to radio-based nets

Wireless terminals halve order, shipping times.

By Ellen Messmer
Washington Correspondent

HIGHLAND PARK, Mich. — Chrysler Corp. network officials are praising the installation last fall of wireless terminal networks at its four national parts distribution centers that has enabled the automaker to halve order processing and shipping times.

Since September, when personnel at Chrysler's national distribution centers began using the hand-held radio frequency (RF)-based terminals to record stock orders and shipments, the auto manufacturer has been able to cut associated paperwork and actual shipment time in half, from 7 days to just 3½ days.

"We wanted to eliminate the middle paperwork," said Lisa Doehring, operations analyst for service parts and distribution at Chrysler, on the decision to install the RF-based system.

Under the old setup, Chrysler order clerks keyed in dealer order information into local terminals, which was processed in batch mode on Chrysler's IBM Systems Network Architecture network.

The IBM systems would generate order documents, which would have to be hand delivered to loaders at shipping docks. The loaders would then fill the orders and jot down all shipments and receivables.

That information would then have to be keyed into a computer by clerks.

But Chrysler decided shipping personnel could be trained to use wireless hand-held terminals to key in the information themselves. The data would be routed into the Chrysler SNA-based network for processing.

In its search for wireless systems, Chrysler opted for Norand Corp. of Cedar Rapids, Iowa, over seven other vendors, because it preferred the ergonomic design of Norand equipment.

Chrysler bought 280 of Norand's RT3210 radio terminals, 22 base stations and 16 network controllers. Norand installed the equipment at the four Chrysler centers — three in Michigan and one in Milwaukee.

(continued on page 18)

Chevron builds local T-1 net for Tariff 12 access

By Paul Desmond
Senior Editor

SAN RAMON, Calif. — Chevron Corp. recently completed construction of a 75-node T-1 network that will provide users with access to a variety of AT&T services offered under a Tariff 12 contract.

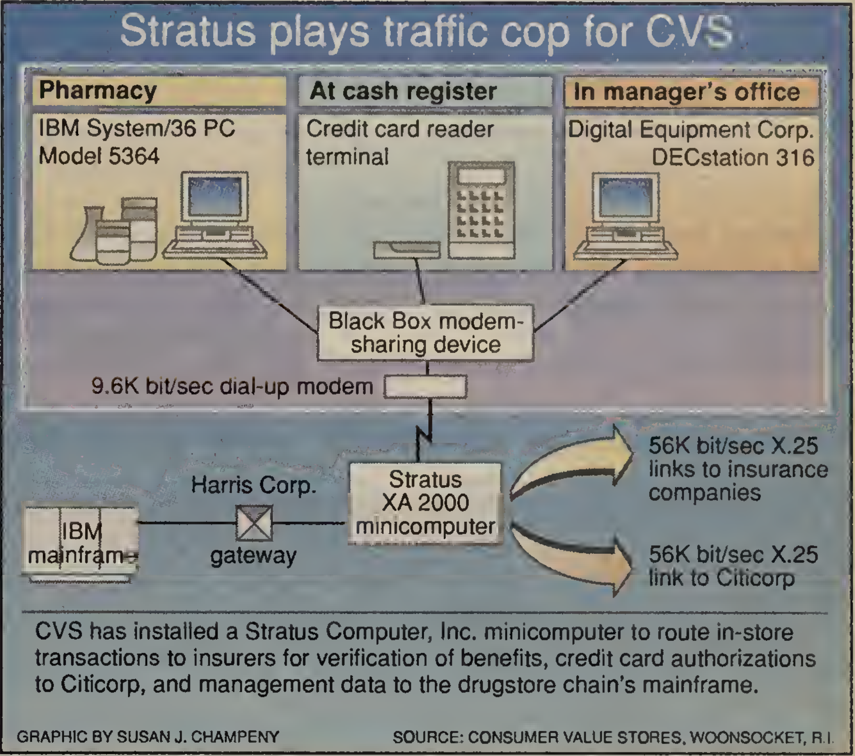
While the T-1 net is not a true long-haul private network, it enables Chevron to consolidate access to AT&T points of presence by using a single T-1 line at each remote site to replace as many as 26 56K bit/sec circuits previously used to access lines linked to AT&T voice and data services supplied under the custom network contract.

Chevron is using a variety of T-1 equipment from Newbridge Networks, Inc. to support its T-1 access lines, said Larry Moran, supervisor of Chevron's network systems group here. Included are about 18 3600 MainStreet intelligent T-1 multiplexers, each of which is connected to a 3624 MainStreet Intelligent T-1 Channel Bank, which supports locally attached devices. The remainder of the sites are supported by Newbridge 3630 MainStreet drop-and-insert multiplexers.

On the local side, that equipment supports attachments to a variety of voice and data devices, including private branch exchanges and cluster controllers. The T-1 lines will also support Cisco Systems, Inc. bridge/routers that are now being installed, Moran added.

The intelligent T-1 equipment lets Chevron pool multiple 56K bit/sec channels so it can dedicate larger amounts of bandwidth to certain applications, such as LAN interconnections or videoconferencing, he said.

Wide-area network services are provided under a Tariff 12 contract Chevron signed last year. That agreement is expected to save the company about $100 million over five years, Moran said, although he could not break out the savings of the T-1 access net by itself. The prices for AT&T services under the Tariff 12 deal made it cheaper for Chevron to build the access net as opposed to a wide-area T-1 net, he said.


Stratus plays traffic cop for CVS

Pharmacy
IBM System/36 PC Model 5364
At cash register
Credit card reader terminal
In manager's office
Digital Equipment Corp. DECstation 316
Black Box modem-sharing device
9.6K bit/sec dial-up modem
Harris Corp. gateway
IBM mainframe
Stratus XA 2000 minicomputer
56K bit/sec X.25 links to insurance companies
56K bit/sec X.25 link to Citicorp

CVS has installed a Stratus Computer, Inc. minicomputer to route in-store transactions to insurers for verification of benefits, credit card authorizations to Citicorp, and management data to the drugstore chain's mainframe.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: CONSUMER VALUE STORES, WOONSOCKET, R.I.

CVS expands scope of its insurance net

Stratus mini at heart of net will route data requests to insurers, credit firms, company's mainframe.

By Jim Brown
Senior Editor

WOONSOCKET, R.I. — Consumer Value Stores (CVS) last week said a network originally installed to cut the cost of verifying drug prescription insurance benefits provided the foundation the chain needed to develop other strategic applications.

Last July, the company installed a Stratus Computer, Inc. XA 2000 transaction processor at its data center here to provide online links to insurance companies nationwide.

Pharmacists can dial into the Stratus from a microcomputer in each store and submit a request to verify a customer's drug prescription benefits and submit claims electronically. The Stratus routes those transactions via leased lines to the appropriate insurance firm's host or to a third-party processor that is linked to the insurance firm.

Once the XA 2000 was installed, CVS designed an application that enables headquarters to dial up each store on a nightly basis to upload payroll records and sales data for centralized processing and download management reports.

The retailer this month plans to roll out an on-line credit card authorization application and is also developing an application that will rival Walgreen Co.'s Intercom network by enabling customers to transfer prescription records from one CVS store to another.

"We are saving a lot of money using the Stratus to connect to insurance companies," said Juan Greene-Dominguez, systems manager at CVS. "But the Stratus also helps us justify doing a lot of other things because it can support multiple applications."

The Stratus system eliminates the need to route all benefits verification transactions to insurance companies via dial-up links to a third-party processor that charged an average processing fee of 7 cents per transaction. With nearly 1,500 transactions an hour, that fee quickly added up, Green-Dominguez said.

The retailer next week plans to roll out an on-line credit card authorization application.

▲▲▲

With the Stratus system, CVS justified the cost of establishing 56K bit/sec X.25 leased lines to the insurance companies receiving the most transactions because doing so eliminated the third-party transaction fee. CVS also established 56K bit/sec X.25 leased lines to third-party processors that charge an average of 3 cents to route each transaction to insurance companies that do not receive enough traffic to cost-justify a dedicated link.

Pharmacists in each of CVS'

(continued on page 20)

NET releases new low-end mux as upgraded replacement for IDNX/10

IDNX/20S retains same price point, but offers more trunks.

By Paul Desmond
Senior Editor

REDWOOD CITY, Calif. — Network Equipment Technologies, Inc. (NET) recently introduced the IDNX/20S, a new low-end member of the IDNX T-1 multiplexer line.

The IDNX/20S replaces the IDNX/10, which will no longer be marketed although NET will continue to support it, said Karyn Mashima, vice-president of corporate marketing at NET, based here.

"The IDNX/10 was really not an appropriate product," Mashima said. "It has the same price point as the [IDNX/20S], but it had only two trunks and it was really competing with channel banks at two to three times the cost of a channel bank."

By contrast, the IDNX/20S can support as many as six T-1 trunks while using the same adapter cards as the rest of the IDNX line, she said. The product supports between eight and 20 adapter card slots, which in turn support either trunk or local voice and data attachments.

Rick Malone, a principal at Vertical Systems Group, a consultancy in Dedham, Mass., said the IDNX/20S is priced and sized at about two-thirds of NET's IDNX/20. The IDNX/20S will compete with mid-tier products such as Timeplex, Inc.'s miniLink multiplexers.

"The competition still has one edge, and that is they can get down into the lower price range using their native protocols, whereas NET still can't do that," Malone said.

The smallest NET T-1 product, the ADNX/48, supports the carrier-standard D4 framing format, whereas the IDNX line supports a proprietary framing standard. D4 framing gives the ADNX/48 support for carrier services such as fractional T-1, but it loses support for some enhanced IDNX net management and routing features, he said.

According to Mashima, the IDNX/20S will complement the ADNX/48, a device based on technology NET acquired from Coastcom, Inc. of Concord, Calif. The ADNX/48 is an intelligent channel bank and could be used to feed into an IDNX/20S, thus increasing the port capacity of the IDNS/20S.

Pricing for the IDNX/20S starts at $16,000, and it is available now. ☑

Chrysler extols move to radio-based nets

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Bernie Crump, project manager at Norand, said the hand-held terminals Norand supplied were set up to emulate IBM 3278 terminals.

"We sold them a device that makes the hand-held device appear as just another [terminal] on the network," Crump said.

According to Crump, few Norand customers use the devices for terminal emulation; instead, most use the RT3210 as a dumb terminal acting as a slave to a personal computer.

"With emulation, you can use the Chrysler terminal, and with a password, you can go into the electronic mail system or any application on the network," he said.

The RT3210 equipment, either hand carried or mounted in a truck, is used by Chrysler personnel to retrieve parts orders and electronically sign off on shipments at the warehouse sites.

"Going with [RF] was pretty risky," Doehring said. "We were asking loaders to do a transaction. We're dealing with a wide range of employees — some don't speak English and some have college degrees."

Although Doehring expected a negative reaction, she said there has generally been enthusiasm for the project among employees because they like the terminals, which they feel give them more control over their work.

Use of the hand-held devices also spurred Chrysler to move from batch processing to real-time processing on its IBM mainframes. "We had to get away from our whole batch system," Doehring said.

The radio-based RT3210 devices feed the data over radio bandwidth spectrum assigned to Chrysler in the 450- to 470-MHz frequency range. The radio signals are picked up by the Norand base stations set throughout the four distribution centers, each with more than a million square feet.

The controllers, which Norand hardwired to the base stations, receive the data from the base stations and route it via modems or dedicated leased lines to the SNA nets at the four distribution centers, where 3090 mainframes process the data.

"The Norand program in the controller adds the correct routing information transparent to the host computer," Crump said.

According to Doehring, processing, shipping time and paperwork has been cut in half through the wireless hand-held system. "I definitely think RF is the wave of the future," he said. ☑

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CVS expands scope of its insurance net

continued from page 17

800 stores in the Northeast enter customer insurance information on a DOS-based IBM System/36 PC Model 5364 microcomputer, which is attached to a modem-sharing unit that feeds data from multiple in-store devices to a 9.6K bit/sec modem supporting an asynchronous dial-up link to the Stratus system.

CVS intends to begin linking the 500 Peoples Drug Stores, Inc. stores it owns in the Washington, D.C. area to the Stratus processor in the same manner later this year.

Greene-Dominguez said nearly 50% of all prescriptions CVS fills today require benefits verification because the customer's insurance company is picking up at least part of the tab. That figure is expected to jump to between 70% and 90% by 1996. "Very few people will be paying cash in the future," he said.

While the Stratus system dropped the cost of meeting insurance company requirements to verify a customer's benefit eligibility as a precondition to receiving claims payments, CVS quickly saw other benefits.

Within the last few months, 816 of the firm's 1,300 stores have been outfitted with Digital Equipment Corp. DECstation 316 microcomputers running DOS. Managers enter payroll and sales data on the microcomputer, which is linked to the modem-sharing unit.

The Stratus system uploads that information over a dial-up link and merges the files from all stores into a single file. The Stratus system forwards that file via a Harris Corp. gateway to a collocated IBM mainframe for batch processing. The Stratus also downloads management reports.

Previously, managers had to send written payroll and sales information to headquarters and had to wait for headquarters to mail out written management reports.

Exchanging information electronically frees up the manager to spend more time with customers, Greene-Dominguez said. "We want the managers on the floor. So if we can eliminate paperwork for them, it will keep them free to take care of our customers."

CVS this month will also roll out its credit card authorization application that will enable card reader terminals in each store to utilize the modem-sharing unit to dial up the Stratus system and pass a customer's credit card number and transaction amount to it. CVS will pass that information via a 56K bit/sec X.25 link to a Citicorp host that will either authorize the transaction or route it to Visa USA, Inc.'s or MasterCard International, Inc.'s network for authorization.

Lastly, CVS is designing an on-line pharmacy application that will enable customers to transfer prescriptions from one store to another.

The application will enable a pharmacist filling or refilling a prescription to check a local data base for the customer's record. If the record is not stored locally, the microcomputer will dial out to the Stratus, which refers to a master customer file.

Once the customer's record is downloaded to the store, the pharmacist can call the customer's doctor for authorization to transfer the prescription. This ensures that the customer is eligible to receive the prescription and reduces the chance that customers can exceed the number of permissible refills by going to different stores.

The application will also enable the pharmacist to ensure that prescriptions written by different doctors and filled at different stores will not adversely affect the customer.

The dial-up links from each store to the Stratus are supported on CVS' MCI Communications Corp. Vnet virtual network and cost roughly 2 cents each. CVS has gained approval from its parent, Melville Corp., to install a very small aperture terminal satellite network later this year that will replace the dial-up links.

The VSAT network will also support other Melville-owned retailers such as Accessory Lady, Inc., Chess King, Freddy's, Kay-Bee Toy & Hobby Shops, Inc., Linens 'n Things, Inc., Marshalls, Inc., This End Up Furniture, Thom McAn Shoe Co. and Meldisco, which operates the shoe department in K mart Corp. stores. Many of these stores are located in the same malls as CVS stores. ◘

Data Packets

continued from page 17

Corp. licensed Soft-Switch's electronic mail connectivity software.

Infonet and Graphnet will use Soft-Switch products to provide connections between customers with disparate E-mail systems. The software will also enable the service providers to offer an E-mail interconnection service to a single customer with multiple E-mail systems. AT&T, Cable & Wireless Communications, Inc. and US Sprint Communications Co. already use Soft-Switch products to interconnect users with disparate E-mail systems.

Graphnet additionally licensed Soft-Switch Network Application Programming Interface (SNAPI) software, which the company will use to develop transparent links from its messaging applications and Soft-Switch Central, a gateway that enables disparate E-mail systems to exchange messages. WordPerfect also licensed SNAPI and will use the software to build a link from its WordPerfect Office office automation product to Soft-Switch Central. ◘

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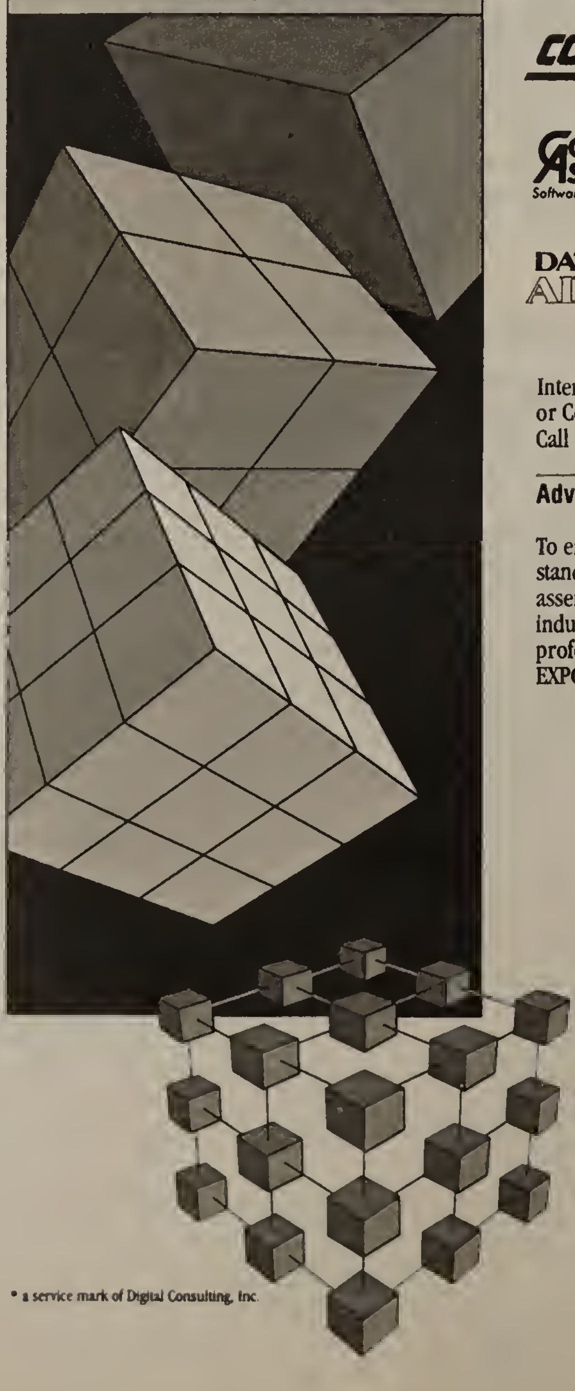

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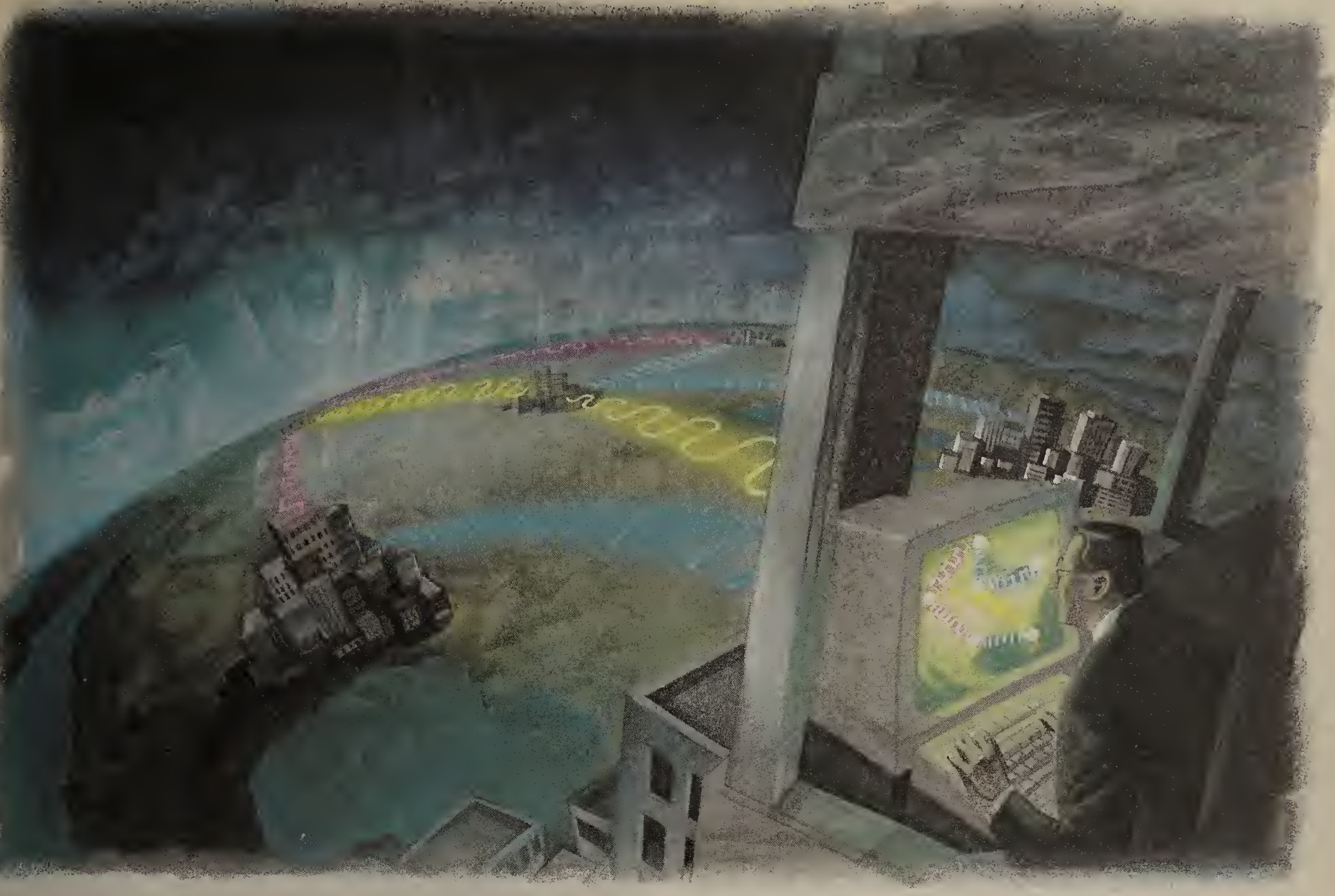

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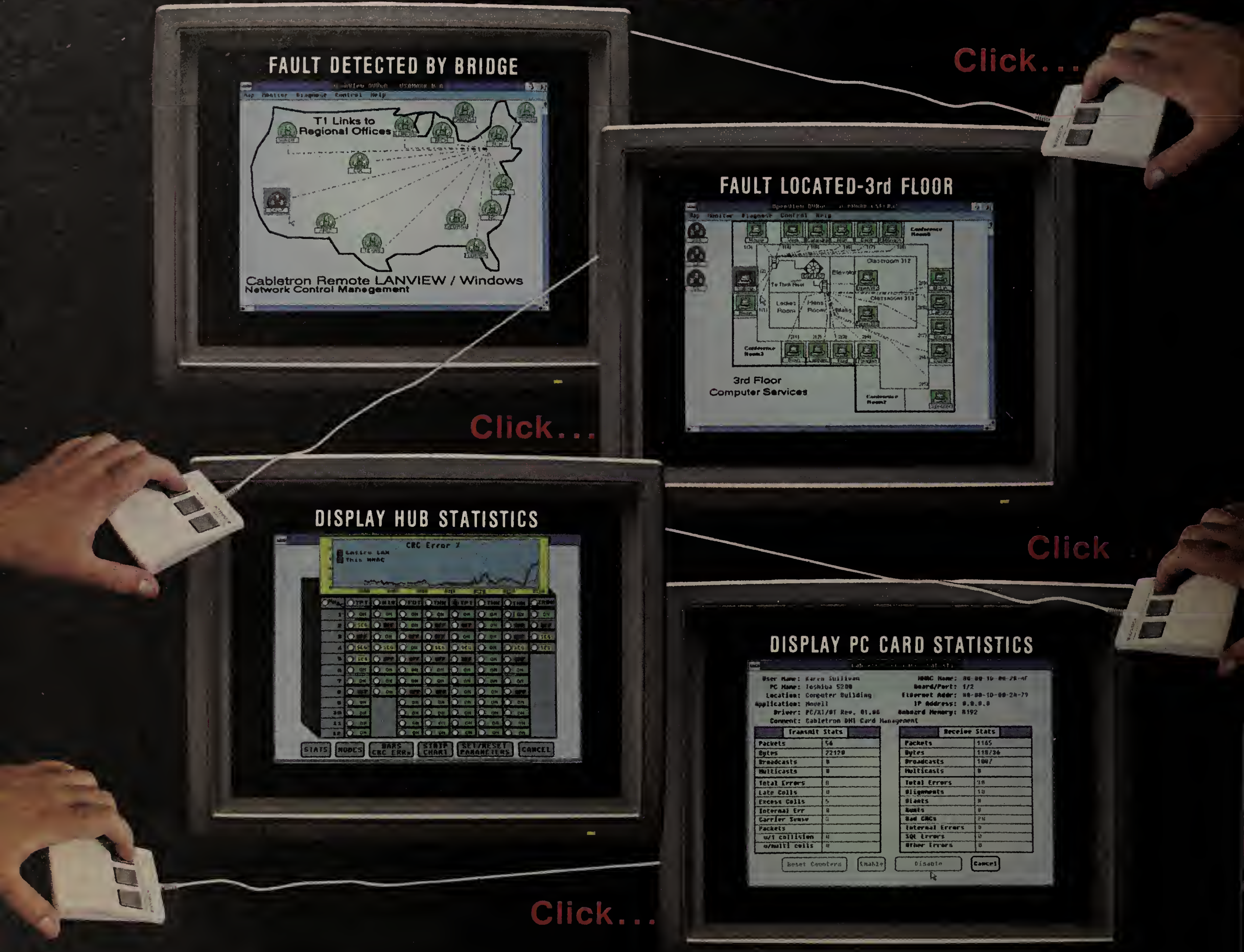

User Name: Karen Sullivan
PC Name: Toshiba 5200
Location: Computer Building
Application: Novell
Comment: Cabletron DNI Card Management
Board/Port: 1/2
Onboard Memory: 8192

Transmit Stats	
Packets	56
Bytes	22120
Broadcasts	0
Multicasts	0
Total Errors	8
Late Colls	0
Excess Colls	5
Internal Err	0
Carrier Sense	5
Packets	
w/1 collision	0
w/multi colls	0

Receive Stats	
Packets	1165
Bytes	[illegible]
Broadcasts	1007
Multicasts	0
Total Errors	38
Alignments	10
Giants	0
Runts	0
Bad CRCs	28
Internal Errors	0
SQE Errors	0
Other Errors	0

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Circle Reader Service #102

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Worth Noting

"By 1992, Novell [Inc.] will have over one million [NetWare] servers installed."

Kenneth Thurber
President
Architecture
Technology Corp.
Minneapolis

Netnotes

Oracle Corp. recently began shipping Oracle Card for Windows 3.0, a portable end-user data base query and application development tool offering a Microsoft Corp. Windows-based interface to Oracle's Relational Database Management System.

In the current release, Oracle Card applications can run unmodified under Windows 3.0 and access data on Oracle servers running on all major platforms and networks. The Macintosh version of the Oracle Card is due to ship by the end of May. By choosing from menu options, Oracle Card users can create data base tables, integrate graphics and images, and query information resident on single or multiple Oracle servers.

The point-and-click interface enables users to build applications by creating stacks of card interfaces to data bases — the same stack and card metaphor used with Apple Computer, Inc.'s Hypercard.

Oracle Card for the personal computer requires a minimum of an Intel Corp. 80286-based personal computer with 2M bytes of random-access memory, Windows Version 3.0 and any Oracle SQL Net product supporting a network operating system or Oracle Tools and Database Version 5.1C or 6.0.

For Apple Macintosh users, Oracle Card is compatible with the company's Hypercard Version 1.2. Oracle Card is available now for $299.

Beyond, Inc. recently announced @Mail Release 1.0, a network-based electronic mail package for Lotus Develop-

(continued on page 24)

Cabletron adds support for private SNMP MIB objects

Also intros Spectrum-to-Accumaster gateway.

By Caryn Gillooly
Senior Editor

ROCHESTER, N.H. — Cabletron Systems, Inc. has released a new version of its Simple Network Management Protocol (SNMP) management station software that adds support for vendor-specific extensions to the first SNMP Management Information Base (MIB-I).

The company also last week introduced a gateway to tie its Spectrum enterprise management software to AT&T's Accumaster Integrator enterprise management system.

The new release of the SNMP management station software, Remote LANView/Windows 2.1, supports MIB-I as did Release 2.0, but now it also includes support for all published proprietary MIB extensions.

MIB-I defines the objects or procedures that can be managed under SNMP. For example, it defines more than 100 objects, but many vendors have added their own objects for use with their particular products.

Although proprietary, many of these extended MIBs are published. Cabletron has included support for all published proprietary MIB extensions in this latest release of Remote LANView/Windows.

When installing the product, customers select from a list of vendors whose products they need to manage. Remote LANView/Windows will then be able to accept alerts and alarms from these vendors' devices.

Among the extended MIBs supported under Version 2.1 of Remote LANView/Windows are those from Novell, Inc., SynOptics Communications, Inc., Wellfleet Communications, Inc. and Xyplex, Inc. "If the customer needs to manage a specialized MIB, we'll add that for them," said Bret Clark, product support engineer at Cabletron, based here.

Cabletron's new Spectrum-to-Accumaster gateway will let administrators integrate management information from devices

(continued on page 26)

Latest 3Com NFS lets DOS clients access Unix servers

By Caryn Gillooly
Senior Editor

SANTA CLARA, Calif. — 3Com Corp. recently unveiled NFS with DPA 1.0, a demand-loadable version of the Network File System (NFS) and Transmission Control Protocol/Internet Protocol that will give DOS clients direct access to Unix servers.

The software will enable DOS clients in various local-area network environments to load the protocols as necessary to access files on NFS-based Unix servers, print on Unix system printers and run Unix-based applications without using all of the workstation's random-access memory.

NFS with DPA 1.0 has been tested on client workstations in Microsoft Corp.'s LAN Manager, Novell, Inc.'s NetWare, and 3Com's 3+ and 3+Open LAN environments, letting clients in any of these environments access NFS servers.

3Com's Demand Protocol Architecture lets users load and unload protocols to meet changing connectivity requirements.

According to Edgar Masri, product line manager for network management and protocols at 3Com, NFS with DPA lets users load and unload one protocol at a time.

"This product is modular," Masri said. "You can load and unload the NFS protocols separately from the TCP protocols."

Users can get terminal-emulation capabilities and connectivity to an IBM host through TCP/IP without keeping the NFS protocols resident, he said. Other products provide NFS connectivity through dual TCP/IP and NFS protocol stacks, a method Masri says uses memory inefficiently.

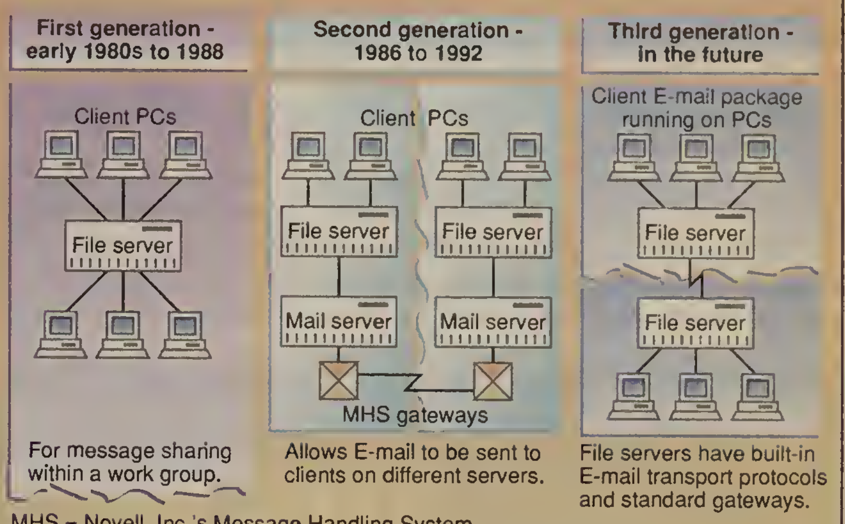
Memory usage, however, is actually a concern for users.

"It takes up more than 80K [bytes], and that's in addition to the LAN Manager software already running," said Jim Woodard, senior network systems programmer at Rockwell Network Transmission Systems Division in Dallas. "But the bottom line is it works."

3Com NFS with DPA 1.0 is available this month at $175 for a single-user license, $750 for a 10-user license and $1,500 for a 30-user license. ◘

The evolution of E-Mail

From the single work group to the enterprise


First generation - early 1980s to 1988
Second generation - 1986 to 1992
Third generation - in the future
Client PCs
File server
Client PCs
File server
File server
Mail server
Mail server
MHS gateways
Client E-mail package running on PCs
File server
File server

For message sharing within a work group.

Allows E-mail to be sent to clients on different servers.

File servers have built-in E-mail transport protocols and standard gateways.

MHS = Novell, Inc.'s Message Handling System

Most users today have second-generation E-mail systems, which require use of cumbersome gateways in order to link to other proprietary systems.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: REACH SOFTWARE CORP., SUNNYVALE, CALIF.

Users await the next generation of E-mail

Future LAN products promise to do away with gateways and use standard transport protocols.

By Caryn Gillooly
Senior Editor

Electronic mail systems for personal computer local-area networks are evolving.

While the proprietary products available today require gateways for intersystem communications, future products will address only the client front end and use standard transport protocols, making it possible to mix and match vendor wares. The change can't come soon enough for users frustrated with the lack of E-mail interoperability.

The Contra Costa Water District in Concord, Calif., for example, has been using Microsoft Corp.'s MS Mail for AppleTalk Networks for almost a year. The water authority needed to add a mail product for its DOS-based networks, according to Timothy Turner, supervisor of data processing at Contra Costa.

Late last year, Turner said, he heard rumors that Microsoft was going to acquire Consumers Software, Inc., a move that was expected to result in the release of a product called MS Mail for PC Nets. In the hopes of having one mail vendor for both the Macintosh and DOS nets, he decided to wait and see what would happen.

The merger went through, but the DOS product that was later released fell short of Turner's expectations.

"MS Mail solved the mail-for-Macintosh problem, and now MS Mail for PC [Nets] solves the problem of mail for our [personal computers]," Turner explained. "But they're still two totally separate products."

The mail products require a gateway to exchange mail. And although the gateway is under development, it will not be available until summer, according to Microsoft. This scenario is not uncommon. The E-mail market is currently in what Reach Software Corp. calls the second generation of electronic mail.

Darwinism

The first generation of E-mail products, which came out in the early 1980s, were based on a messaging application running on a file server and supporting personal computers in a work group, according to Anand Jagannathan, president of Reach Software in Sunnyvale, Calif. Users could not send messages to other work groups.

> The change can't come soon enough for users frustrated with the lack of interoperability.

▲▲▲

The second generation, which is today's technology, is based more on a client/server architecture in which the client side provides the user interface and a server component provides the store-and-forward transport ser-

(continued on page 26)

Chipcom intros ONline network mgmt. system for intelligent hubs

By Timothy O'Brien
West Coast Bureau Chief

SOUTHBOROUGH, Mass. — Chipcom Corp. today introduced the ONline Network Control System (NCS), a Unix-based network management system for the company's line of intelligent net hubs.

Based on the Simple Network Management Protocol (SNMP), NCS will enable customers to use a graphical display in order to view and change network topologies, reconfigure network devices or relocate users on the net.

Prior to the introduction of ONline NCS, Chipcom had only offered a low-level terminal-based network management system that provided an instant snapshot of network activity and had no data retention capability.

ONline NCS is designed for use on Intel Corp. 80386 or 80486 microprocessor-based personal computers and is built on The Santa Cruz Operation, Inc.'s Open Desktop graphical operating system. Open Desktop combines the Unix System V operating system, an Ingres Corp. relational data base management system and the Open Software Foundation's Motif graphical user interface.

Although Chipcom's hub already supports the standard SNMP Management Information Base (MIB) objects, with ONline NCS, the company has added 70 unique MIB extensions that provide additional network management functionality.

ONline NCS supports Chipcom's Tri-Channel Architecture, which enables ONline System Concentrators to support Ethernet, token-ring and Fiber Distributed Data Interface networks concurrently in a single concentrator.

Chipcom's ONline System Concentrator features redundant power supplies and cable links to minimize downtime, which provides a level of fault tolerance. NCS extends that capability with new monitoring features that collect and report performance figures and network statistics continuously to identify problems in their early stages.

"Look on our software as CPR so an emergency bypass can be done," said David Fowler, vice-president of marketing at Chipcom. "We don't think it's enough to give a 30-second warning and then do the autopsy."

Even though NCS relies on various grades of alarms to signal alerts to net managers, NCS allows users to write subroutines that automatically take action when a certain alarm condition occurs. In addition, users can create detailed network maps to help monitor net events and diagnose problems such as the location of a faulty network device.

Fowler acknowledges that in order for NCS to correct network problems without human intervention, it is essential that the initial network design be configured to the user's specified requirements. However, he maintains that NCS gives users more flexibility than other network management programs that only provide a monitoring system requiring a person to execute commands.

For configurations with 12 or less hubs, ONline NCS costs $6,500. For more than 12 hubs, it is priced at $12,500. ONline NCS is scheduled to be available in 60 days.

Netnotes

continued from page 23

ment Corp.'s 1-2-3 and Symphony users.

@Mail allows users to perform all E-mail functions from within their spreadsheets, share spreadsheet data and use specified changes in a spreadsheet as a trigger to create and send E-mail messages automatically.

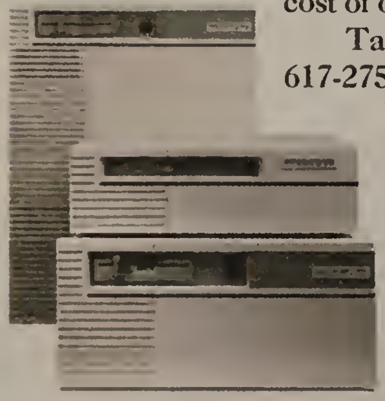
Employing add-on technology licensed from Lotus, @Mail works with 1-2-3 Release 2.X and Symphony Releases 1.1 and beyond. The first release of @Mail uses the Message Handling System (MHS) and supports Novell, Inc.'s NetWare and Microsoft Corp.'s LAN Manager.

@Mail, scheduled to ship this month, is available in three configurations. The Starter Kit costs $129.95, the @Mail Node Edition is priced at $79.95, and the Eight Node Expansion Pack costs $395.

Lotus Development Corp. recently began shipping the cc:Mail Windows Platform Pack, which now supports Microsoft Corp.'s Windows 3.0. Windows support is part of Lotus' plan for multiplatform connectivity, allowing E-mail to be sent to users in MS-DOS, OS/2 and Macintosh environments without requiring gateways between them.

The cc:Mail Windows Platform Pack, a full-featured implementation of cc:Mail, now adds the ability to open multiple messages, folders and mailing lists on a screen and interchange objects as desired. The new product also enables users to configure the level of external application integration for the Windows environment.

The cc:Mail Windows Platform Pack is priced at $495, which includes network administration capabilities. The network may be expanded in eight- or 25-user blocks for $195 and $595, respectively.



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Circle Reader Service #101

Users await next generation

continued from page 23

vice used to send messages. These two functions are most often referred to as the front and back ends of mail products.

The leading providers of today's LAN E-mail packages are Action Technologies, Inc., cc:Mail, Inc., CE Software, Inc., Da Vinci Systems Corp., Enable Software, as well as the top LAN providers, Banyan Systems, Inc., Microsoft and 3Com Corp., according to Link Resources Corp., a market research and consulting firm in New York. Novell, Inc. does not offer an E-mail package.

Virtually all of these products are proprietary, and each has a different user interface and its own transport mechanism. Connecting them is impossible without gateways.

Tomorrow's generation

We are just beginning to see the dawn of a new age of E-mail in which the user interface is truly separate from the transport mechanism and the back end is based on industry and de facto standards such as Novell's Message Handling System and the Open Systems Interconnection X.400 mail transport protocol.

"The client/server architecture is structuring the mail world," said Mark Winther, vice-president of electronic communications at Link Resources.

Winther explained that in what Reach calls the third generation of E-mail, the front ends will be intelligent applications that not only have the ability to acknowledge that a message has been received, but also tell the sender that the message was acted on and sent to another destination.

The back end and gateways will be based on standards and embedded in the network operating system, Winther said, while the front end will be a separate product.

"E-mail vendors will do the front end, and network vendors will do the back end," he said. "Once [the transport mechanism] is built into the network operating system, any front end can be a client to that server."

Winther added that because the back end will be tied so closely to the network operating system, the next generation of mail products will use the network's directory naming service instead of requiring its own, as is the case with today's products. ◪

Cabletron adds MIB support

continued from page 23

controlled by Spectrum into AT&T's Unified Network Management Architecture, according to Cabletron.

AT&T's Accumaster is a network management system designed to enable users to centralize control of element management systems handling specific types of network equipment.

Spectrum is a distributed network management system for managing hardware and applications in client/server LAN environments.

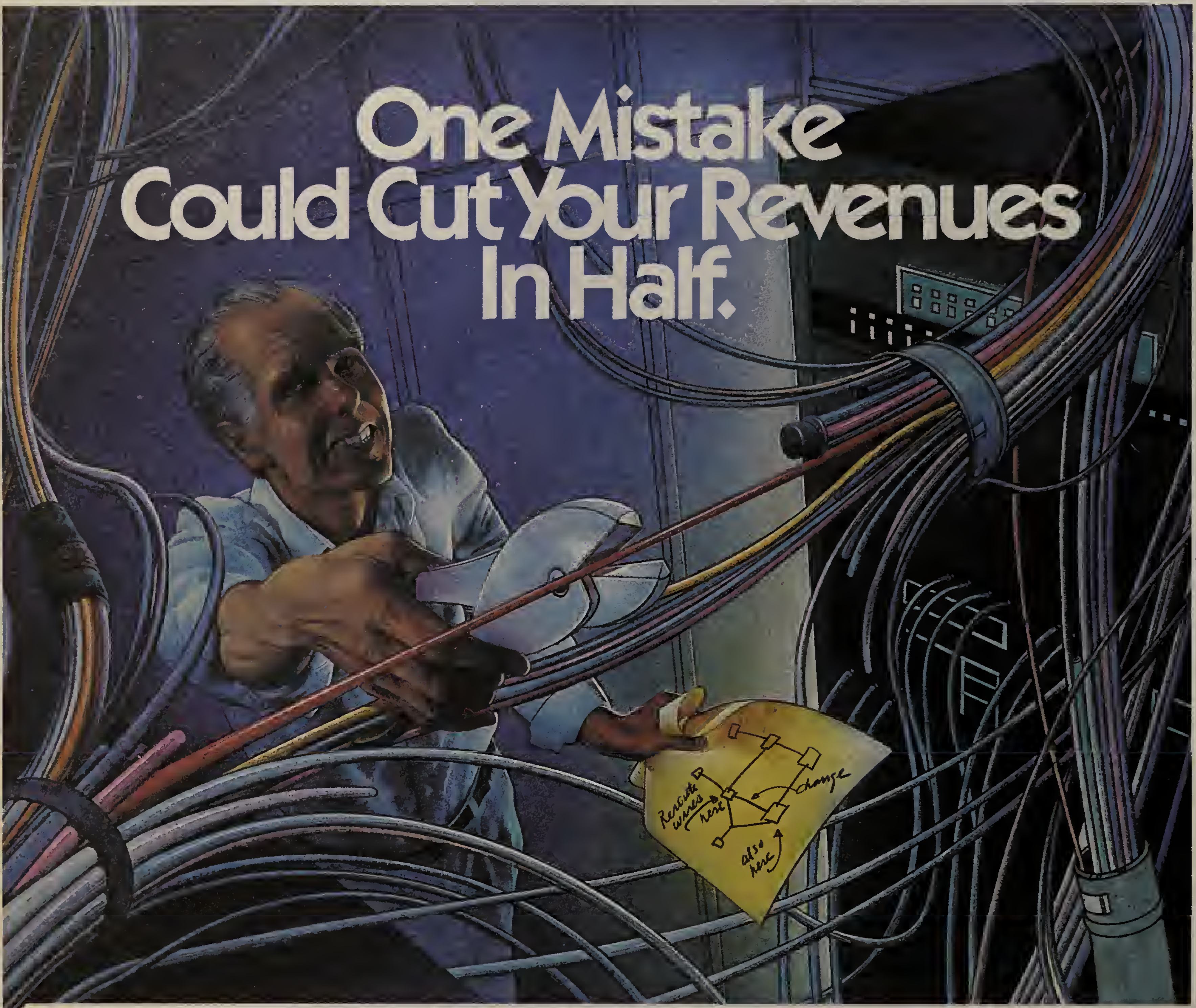
Before the release of this gateway, Accumaster could receive alerts and alarms from Spectrum, which uses artificial intelligence. But many of the Spectrum statistics were too "high end" and baffled the AT&T system.

The gateway will enable Accumaster to receive, for example, a model of the entire network — down to the cables, subnets, applications and protocols. Accumaster will also be able to use Spectrum's ability to automatically isolate hardware failures and software error sources.

The company already offers a similar gateway connecting Spectrum to IBM's NetView network management product.

"Cabletron's development of gateways — first for IBM's NetView and now for AT&T's Accumaster — allows users of both platforms to take advantage of Spectrum's inductive reasoning features," said Roger Dev, Cabletron's director of software development.

Remote LANView/Windows 2.1 will be available in July for $4,995. The Spectrum gateway to Accumaster, available now, is priced at $11,995. ◪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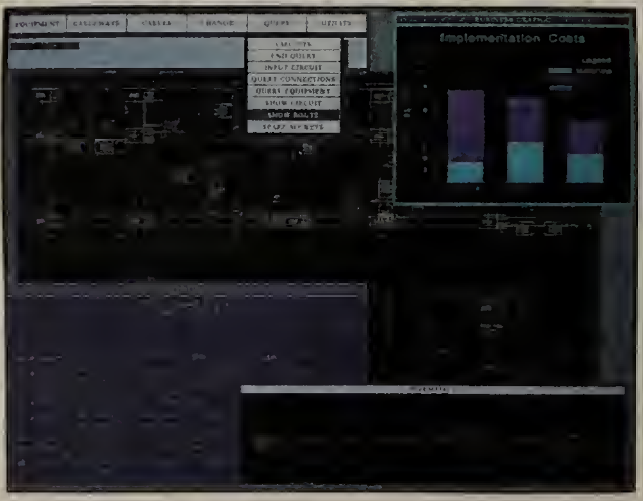

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MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USER GROUPS AND ASSOCIATIONS

Worth Noting

"People won't do what they're expected to do, but what they're inspected to do."

David Norton
President
Nolan, Norton & Co.
Lexington, Mass.

Association Watch

Shiva Corp. will hold its first annual West Coast FastPath User Group meeting on May 28 at the Hotel Sofitel in Redwood City, Calif. An East Coast FastPath User Group meeting will be held June 10 at the Lenox Hotel in Boston.

FastPath is an Apple Computer, Inc. AppleTalk-to-Ethernet gateway that Shiva acquired from Novell, Inc. last spring.

More than 30,000 customers have implemented FastPath, according to Shiva officials.

The meetings will include speakers, hands-on technical training and product demonstrations.

No fee will be charged for attendance at either meeting.

For more information, call Amy Gelpey at (617) 252-6480.

The **Help Desk Institute**'s annual conference will be held from July 23 to 26 at the Fairmont Hotel in San Francisco.

The conference, titled "Artificial Intelligence and the Help Desk," will feature sessions about planning and implementing help desk applications using artificial intelligence.

In addition, the meeting will include demonstrations of expert system-based help desk networks.

A number of vendors will be on hand to exhibit the latest Help Desk products. The conference costs $695 for members and $795 for nonmembers.

For more information, contact Elaine Worthington at (800) 248-5667. ◘

Maritime group navigating through EDI net pilot test

Hopes to make seaway better transport option.

By Wayne Eckerson
Senior Editor

Eleven members of the Great Lakes and Saint Lawrence Seaway maritime community recently began pilot-testing an EDI network that promises to speed the movement of cargo through ports and give users faster access to important shipping information.

Dubbed the Seaway Automated Information System (SAIS), the network lets port authorities, shippers, brokers and other members of the maritime community access up-to-date information on vessel locations, itineraries, weather conditions and other maritime information.

The network will not only support electronic data interchange, but an electronic bulletin board, electronic messaging and a cargo-tracking data base as well.

"The pilot, if successful, will make the seaway a more competitive transportation route for shipping goods to and from North America," said Stan Parris, administrator for the Seaway Corp., which sponsored the EDI net pilot.

Companies participating in the pilot include the Port of Milwaukee; Fedcom, Inc., an ocean carrier based in Montreal; C.J. Tower Co., a freight forwarder in Buffalo, N.Y.; Quast and Co., a freight broker based in Chicago; Burns International Harbor, a port in Portage, Ind.; and the Saint Lawrence Seaway Authority of Canada.

The pilot participants use personal computers to dial into GE Information Services' (GEIS) value-added network. They are then presented with a menu that allows them to access several electronic bulletin boards and send or receive either an EDI document using GEIS' EDI*Express service or an electronic mail message using GEIS' QuikComm messaging service.

For example, the carrier Fedcom can send Transportation Data Coordinating Committee 323 EDI documents, which con-

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GUIDELINES
BY ERIC SCHMALL

Net mgrs. must keep informed to be prepared

In many companies, network departments are the last to know about important business projects but are expected to be the first to deliver services supporting the new initiatives. Net departments need to plan, order, install and test communications equipment to support new business endeavors, such as a new branch office. Unfortunately, all this takes more time than senior management anticipates.

Being the last informed means network managers have to get up to speed with the project and assess its needs. This process invariably produces a series of unpleasant shocks.

First, net managers have to shift their staff's attention to a new mission-critical project for which they have little time to perform a proper analysis. Second, network administrators often have to tell senior management they can't meet the project's timetable or budget. The project planners may not have considered the time it takes carriers to provision new circuits or the cost of those services and associated equipment.

Now everyone's angry: The network department is frustrated because there isn't enough time to do the job correctly and the department is being blamed for slowing the project down; the network manager has to play the role of nay sayer; and senior management is upset by cost overruns and missed schedules.

The primary mission of corporate network managers today is to ensure that they are apprised of all business activity that might affect their area. Net managers should make it a point to attend departmental staff meetings and talk to key businesspeople regularly. Through meetings, conversations and briefings with users, net managers can keep abreast of what's going on within their company and be adequately prepared to meet all corporate communications needs. ◘

The feds standardize on X12

What:	The Department of Commerce last month announced a FIPS which recognizes the ANSI X12 standard for EDI. Use of the EDI for Administration, Commerce and Transport (EDIFACT) standards for international EDI is also permitted.
When:	The mandate becomes effective Sept. 30, 1991. All federal agencies using EDI must comply within 5 years.
Who it affects:	Federal agencies currently using proprietary EDI standards, such as: • Healthcare Financing Administration • Environmental Protection Agency (migrating now) • Internal Revenue Service (migrating now) • Customs Service (migrating now) Also affects all nongovernmental trading partners currently using proprietary EDI standards.
Who it doesn't affect:	Federal Agencies currently using X12 standards, such as: • Department of Defense • General Services Administration • Department of Veterans Affairs

FIPS = Federal Information Processing Standard

GRAPHIC BY SUSAN J. CHAMPENEY

SOURCE: ROY SALTMAN, EDI PROJECT LEADER, NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY, WASHINGTON, D.C.

Dept. of Commerce issues EDI mandate

Requires all gov't agencies involved with EDI to adhere to ANSI X12 and EDIFACT standards.

By Maureen Molloy
Staff Writer

WASHINGTON, D.C. — The Department of Commerce recently approved the Federal Information Processing Standard (FIPS), which requires all government agencies involved in EDI programs to embrace ANSI X12 and EDI for Administration, Commerce and Transport (EDIFACT) standards.

The standards mandate, which takes effect next fall, will make it easier for federal agencies and nongovernment organizations to exchange data.

According to Jerome Dreyer, president of the Electronic Data Interchange Association, adoption of the FIPS illustrates the government's commitment to EDI as a means to stem waste and increase productivity.

"FIPS basically states that EDI is something the government wants to do, and it wants to do it using a standardized format," Dreyer said. "It's great news to have a major entity like the federal government stand up and say, 'Standards-based EDI is the way to go'."

Roy Saltman, EDI project leader at the National Institute of Standards and Technology (NIST), said the new requirement will ensure that there are no more proprietary EDI formats adopted by federal agencies.

NIST, in its role as a standards setter for the government, recommended the move to X12 and its international corollary, EDIFACT, after it discovered that many federal agencies were employing proprietary EDI formats.

The various standards made EDI transmissions among federal users difficult and caused problems for businesses exchanging documents electronically with multiple agencies.

"FIPS will guarantee that users need only implement one set of standards for trading documents with all federal agencies," Saltman said. "Already, FIPS has nipped several federal proprietary EDI systems from being generated."

The mandate allows a five-year lead time to give federal agencies and nongovernment organizations currently on proprietary systems sufficient time to migrate to the X12 standard, he added.

"Already, FIPS has nipped several federal proprietary EDI systems from being generated."

▲▲▲

Ben Milbrandt, EDI systems analyst at Consolidated Freightways in Portland, Ore., hailed the announcement as good news for private companies conducting business with the government. Consolidated Freightways will soon begin sending EDI invoices to the U.S. Marine Corps.

"I'm elated because now we can do EDI with the government just as we do with most of our other 1,600 trading partners," he said.

Daniel Browning, EDI manager of Baxter Healthcare Corp., called the announcement a major

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Maritime group testing EDI net

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tain vessel schedule and itinerary information, to the EDI mailboxes of the other users on the SAIS net. Sending such data via EDI gives other SAIS participants more time to prepare for the arrival of Fedcom ships and arrange for cargo transfers and pickups.

Users currently have access to five bulletin boards, which are updated by designated members of the pilot program on a daily or weekly basis. These bulletin boards post information about ship movements within the Great Lakes and Saint Lawrence Seaway waterways as well as weather conditions and advisories.

Eventually, the EDI network will enable shippers, brokers and customs officials to electronically exchange bills of lading, invoices, payment orders, bookings and delivery orders, said Charles Stevens, program manager at GEIS. This would allow shippers to file required documents before reaching port, speeding the cargo-handling process. Most of this processing is now done via facsimile, telephone or the U.S. mail, Stevens said.

Seaway Corp. has put up the seed money for the project but does not intend to run the program after the pilot finishes at the end of September. A permanent operation would have to be funded by all members of the seaway maritime community. ◼

Commerce Dept. mandates EDI

continued from page 27

first step toward standardization. But he said NIST must still tackle some other issues. For example, the government must standardize on individual transaction sets within EDI standards.

A standard X12 purchase order, for instance, has mandatory fields that each user must follow. But it allows for significant flexibility in optional fields, where individual users determine the type of information to be included.

"If we have many purchase orders coming into us from various government agencies, even though they're all using the X12 standard, they could each be sending us different information," Browning said. "We'll still need to do a first-time map with each government trading partner before it's truly standardized."

As the largest supplier of medical supplies to the Department of Veterans Affairs, Baxter Healthcare currently uses the X12 standard to send EDI invoices to the department. The administration, in turn, uses X12 to send electronic remittances back to Baxter Healthcare.

"Standardizing on X12 is certainly a step in the right direction, but it's not the cure-all," he said.

NIST's Saltman said several large federal agencies have already adopted the X12 standard and welcome the announcement as a significant push for the adoption of standards-based EDI.

In addition to the Department of Veterans Affairs, other users of X12-based EDI include the Department of Defense, the General Services Administration and the Customs Service.

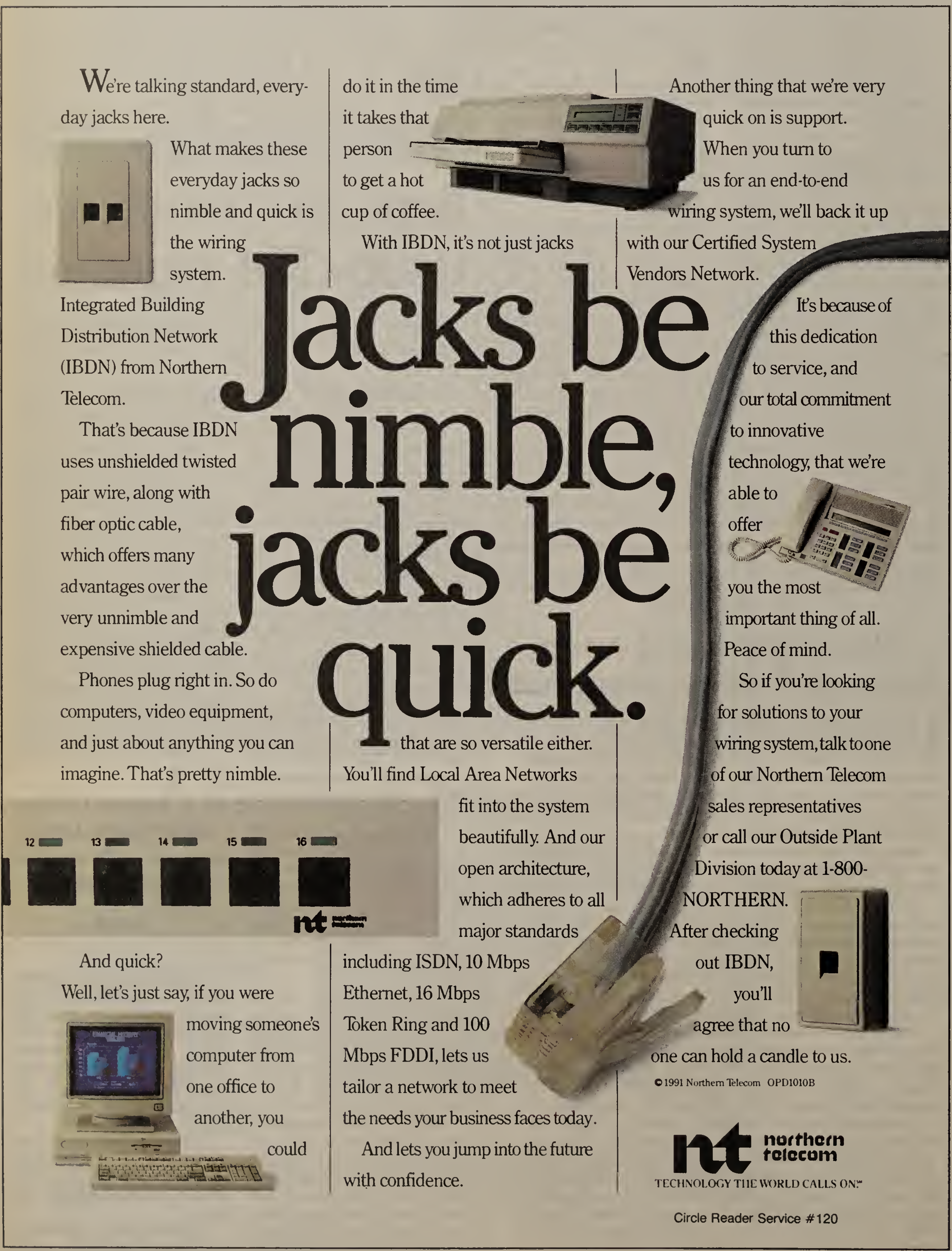
But there are grumblings from agencies and nongovernment trading partners currently on proprietary systems, said Roger Cadaret, an EDI consultant at Ernst & Young.

A battle is forming over the FIPS directive in one agency in particular, he said. The Healthcare Financing Administration has been committed to a direction other than X12 for its EDI transactions and is looking to protect a huge investment in its proprietary system.

"The argument from the non-X12 agencies is that there's not adequate time or money to make the switch from their current systems to X12. It's for this reason that I don't think we'll see rapid implementation at the government level," Cadaret said.

Officials of the Healthcare Financing Administration were unavailable for comment by press time.

Although FIPS does not formally mandate EDI systems, Cadaret said most nongovernment organizations doing business with a federal entity will eventually be expected to support EDI. ◼



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Circle Reader Service #120

INTERNATIONAL NETWORKS

USER STRATEGIES, INTERNATIONAL SERVICES & REGULATION

World News

Singapore Telecom last week said it has launched international Integrated Services Digital Network service to Hong Kong.

Hong Kong now becomes the fifth country to which Singapore Telecom offers international ISDN service, following Australia, Japan, the U.S. and the U.K. Singapore Telecom said it plans to commence international ISDN service to France and Germany by year end.

Users access Singapore Telecom's international ISDN service via the carrier's local ISDN service, which then routes traffic over an international circuit-switched 64K bit/sec ISDN B channel.

The carrier charges 4.1 times the standard International Direct Dial (IDD) charges for the first 30 seconds of international circuit-switched 64K bit/sec service and 1.3 times the standard IDD charge for each subsequent six seconds of service.

World Communications, Inc. (WorldCom), an international carrier based in New York, recently said it has received a contract to supply international network services to money broker Tullett & Tokyo Forex, Inc.

Tullett & Tokyo is purchasing international switched services from WorldCom and a 2.048M bit/sec European T-1 circuit between the U.S. and the U.K. that will be routed over the Private Trans-Atlantic Telecommunications-1 international fiber-optic cable. ◼

Bell Labs study confirms gains from undersea optics

New technology could quadruple int'l line capacity.

By Maureen Molloy
Staff Writer

SAN DIEGO — A new AT&T Bell Laboratories study maintains it is possible to transmit data across undersea cables at gigabit speeds, thus raising carriers' hopes that the technology could usher in a fourfold increase in bandwidth capacity for international nets during the next four years.

The study focused on the use of emerging optical amplifier technology, which could have a dramatic effect on international communications because its faster transmission rates will provide improved traffic capabilities between continents.

"The study showed we'll be able to increase the capacity and flexibility of undersea systems and simplify repeater design at the same time," said Neal Bergano, an engineer at Bell Labs Undersea Systems Laboratory. "And despite the increased capacity of the system, the cost will remain roughly the same as current systems."

The first all-optical channel will be installed in 1995 at 2.4G bit/sec and will be upgradable to 5G bit/sec, he added.

In optical amplifier systems, light signals are boosted as they pass through spliced-in segments of optical fiber containing the rare earth element erbium. Erbium has the ability, when struck with a laser, to amplify any photonic signal flowing through the

(continued on page 31)

IBM extends public net as IVAN rules are relaxed

By Barton Crockett
Senior Editor

TAMPA, Fla. — IBM recently said it has extended its Information Network into Argentina, Mexico and Venezuela, a move that will enable users in those countries to attach Systems Network Architecture nets directly to IBM's public network.

By establishing nodes in the three countries, IBM makes it possible for users to bypass local X.25-based networks. On a larger scale, the move furthers a growing trend toward liberalization of international value-added network (IVAN) restrictions.

Previously, these three countries had some of the world's most restrictive IVAN regulations, including rules that barred IBM from opening its own Information Network nodes within the countries' borders.

But now Argentina, Mexico and Venezuela have relaxed restrictions on foreign IVANs, and IBM is moving in to meet customer demands for service, said Don Martin, manager of international operations with the IBM Information Network here.

"Clearly, these countries fit into a larger trend," Martin said. "I believe that companies in countries where restrictions [on IVANs] are tight are telling their governments that eventually they are going to be at a disadvantage" unless the governments

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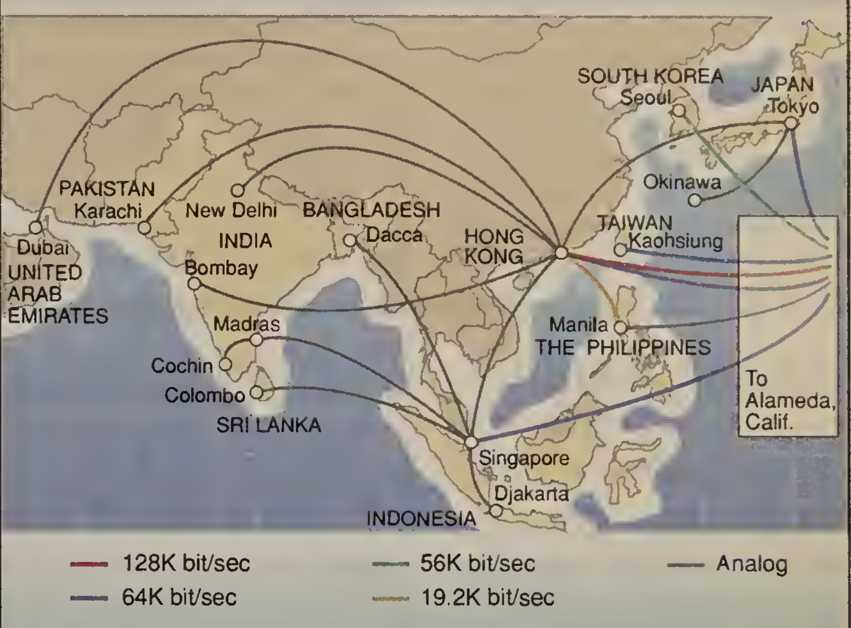
American President Companies, Ltd.'s Pacific Rim network



GRAPHIC BY SUSAN J. CHAMPENY SOURCE: AMERICAN PRESIDENT SYSTEMS, LTD., OAKLAND, CALIF.

User looks to meld voice, data facilities

Sharing of digital facilities in Pacific Rim could save American President Systems thousands.

By Barton Crockett
Senior Editor

OAKLAND, Calif. — American President Systems, Ltd. is investigating the possibility of integrating compressed voice and data traffic onto shared digital facilities in the Pacific Rim.

Such a move would save the international shipping giant thousands of dollars otherwise spent on maintaining separate voice and data transmission facilities.

American President Systems, the data processing and networking arm of American President Companies, Ltd., based here, is trying to find where integration of compressed voice and data traffic is economically viable and where regulators will permit it.

At the moment, American President Systems is experiencing substantial savings from the integration of voice and data traffic onto a 128K bit/sec private line between Hong Kong and the U.S. But despite apparent cost savings in other areas, such as in Taiwan, American President Systems has been unable to integrate voice and data traffic onto shared circuits due to prohibitive regulations.

"While in the U.S. people are moving away from private voice lines and private voice networks, in Asia, it's still cost-beneficial to consider that," said John Bischoff, American President Systems' manager of telecommunications planning and engineering.

American President Systems operates a sprawling digital and analog network in the Pacific Rim that supports American President Companies' core shipping business (see graphic, this page).

(continued on page 31)

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Circle Reader Service #112

FCC faces deadline for Tariff 15

continued from page 13

Besides the difficult legal questions the FCC must sort out about Tariff 15, sources have said for some time that the agency has moved slowly on the investigation because it wants to settle it in the context of a larger proceeding on AT&T's status in the market.

The FCC opened a proceeding last year to determine whether AT&T has lost its dominance in the large-customer market and if lessened regulation is appropriate. Since the agency has set a date for deciding Tariff 15, there is increased pressure for it to finish the AT&T dominance proceeding.

FCC Common Carrier Bureau Chief Richard Firestone also appeared at the telecommunications conference. Although he did not directly confirm that the agency has put Tariff 12 and 15 decisions on hold until completion of the AT&T proceeding, he did acknowledge its importance.

"The commission felt it was important to resolve many of the complex issues being fought before us by competitors through comprehensive rule making rather than on an ad hoc basis," he said. Firestone also said the agency's decision on the legality of Tariff 12 may be resolved through the AT&T proceeding. "One reason the interexchange proceeding is important is the status of the Tariff 12 process," he said. Tariff 12 was sent back to the FCC for further investigation after an appeals court last fall ruled the agency had considered improper factors in allowing AT&T to offer the custom network deals.

"Unfortunately, AT&T's Tariff 12 customers are at some risk since the D.C. Circuit's decision," Firestone said. The FCC hopes to resolve the AT&T proceeding by this summer.

Firestone gave few clues on how the FCC currently views Tariff 12 other than to say the agency will focus on "not what is best for one carrier or another, but what is best for the user." Numerous large users have had personal meetings with the FCC or have written letters supporting Tariff 12.

One of the proposals offered by the FCC in its examination of AT&T's market status is to allow the carrier to offer services via contract and make public only a synopsis, which may provide substantially less information than tariffs. Observers have speculated that if the FCC adopts this proposal, it would resolve the thorny legal problems created by Tariffs 12 and 15, each of which has provisions that may violate tariff rules or discrimination provisions of the Communications Act.

Although the officials at the conference did not comment on the question of allowing AT&T to conduct business through contracts, Boothby indicated that the agency thinks the courts would uphold such a decision. Boothby said the court "went out of its way" to endorse a shipping case known as Sea-Land [for shipper Sea-Land, Inc.], which she claims upholds the idea of common carriers offering service via contract. The Sea-Land case centered around requirements of the Interstate Commerce Act, the document after which the Communications Act of 1934 was modeled.

"This suggests that the court may be far more receptive to Tariff 12 pricing than the remand might imply," she said.

Carrier watch

continued from page 13

sage waiting indication on telephone sets.

Pacific Bell will offer a one-year warranty on the systems and provide installation and on-site training for telecommunications managers.

The company also offers full-service support including system feature installation, training for system administrators and end users, as well as two follow-up consultations on system performance optimization.

The Digital Sound voice-messaging systems can be configured to support eight to 40 ports and can serve a maximum of 3,000 end users. The equipment supports optional features such as CallController, which enables users to customize the system's call routing; MessageNet, which enables digital networking for multiple systems; and Report Manager, which provides extended system usage reporting.

Customers who choose Pacific Bell's Digital Sound systems will be able to communicate through the Bell operating company's voice mail network to companies that use its voice mail service, which is based on Digital Sound equipment.

IBM extends public net

continued from page 29

loosen these restrictions.

Martin said he believed that other countries in Central and South America with restrictive IVAN regulations will follow the lead of Argentina, Mexico and Venezuela in loosening IVAN restrictions, though he declined to speculate which countries will act and when.

By opening Information Network nodes in the three countries, IBM will be able to vastly expand its service offerings. Previously, users in Argentina, Mexico and Venezuela could only access the Information Network via local, X.25 public data networks.

Additionally, the move has now led IBM to actively market and support Information Network services in Argentina, Mexico and Venezuela, where it previously did not provide the offerings.

The new nodes also will enable IBM to roll out new and enhanced Information Network services such as enhanced electronic mail and electronic data interchange services in those countries.

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User looks to meld voice, data

continued from page 29

Until this year, American President Systems' Pacific Rim network carried only data; voice traffic was routed over the public switched network.

But in February, Bischoff said, American President Systems carved out six 8K bit/sec voice channels from one 128K bit/sec private line linking the company's Alameda, Calif., hub to offices in Hong Kong.

This private line is supported by Newbridge Networks, Inc. multiplexers that American President Systems is using on digital private lines throughout the Pacific. According to Bischoff, routing voice traffic over the 128K bit/sec link will save American President Systems enough money to cover the investment in the Newbridge equipment very quickly. He declined to be more specific.

Bischoff added that American President Systems may integrate voice and data on circuits running from Alameda to hubs in Singapore and Tokyo should the move prove economical.

Likewise, American President Systems is evaluating the economic feasibility of integrating voice and data traffic onto digital private lines between company facilities in South Korea. Monthly savings of hundreds of thousands of dollars could result from voice and data integration in South Korea, according to company officials.

Taiwan bottleneck

American President Systems is confident that integration of voice and data traffic onto shared digital private lines within Taiwan and between Taiwan and the U.S. would be a big money saver. But the company cannot move ahead because of regulatory restrictions in Taiwan on the transmission of public switched net traffic to and from private lines.

Ideally, American President Systems would like to let company employees in the U.S. use the domestic public switched network to call into a digital private net that would route calls from a company hub in Alameda over a 64K bit/sec link to a hub in Kaohsiung, Taiwan.

Likewise, American President Systems would like to route calls from employees in Taiwan to the U.S. over an international private line.

But regulators prohibit interconnection of both ends of a private line to the public net in order to keep resellers from using private lines to sell switched services in competition with Taiwan's government-owned carriers.

Without public net access at both ends of the firm's international private line, integration of voice and data traffic to Taiwan is not economical, Bischoff said. The restriction even keeps American President Systems from integrating voice and data traffic onto a private net within that country, though it has no intention of ever commercially selling public switched voice services.

AT&T helps out

AT&T has helped American President Systems by explaining to Taiwan's chief regulatory agency, the Director General of Telecommunications (DGT), why American President Systems wants to have public net access at both ends of the private line. Bischoff said that, according to AT&T, the DGT has indicated that approval for public/private net interconnection is forthcoming.

"But they said approval was forthcoming in September, November and January, and we still haven't gotten formal notice that's the case," Bischoff said. ◼

Study confirms optical gains

continued from page 29

fiber cable. Light wave signals can, therefore, be boosted without converting them into electrons and then back into light, as is necessary in conventional systems.

To strengthen the signals, current light wave systems use electronic repeaters situated every 50 miles along the undersea cable to convert light pulses into electrical signals and back. The signals need to be regenerated periodically because the light pulses broaden and lose their shape as they propagate down the cable.

Increasing capacity on current fiber would require simultaneous upgrades to the regeneration repeaters in the undersea cables, a task that, while feasible, is not attractive due to cost constraints. The use of optical amplification, however, could revolutionize international communications by making it possible to increase the capacity of undersea cables simply by changing the nodes at each end of the cable and not the repeaters embedded undersea.

A new all-optical cable using optical amplifiers and operating at 2.4G bit/sec will have the capacity to support 300,000 simultaneous telephone calls.

By contrast, the first transoceanic light wave system, Trans-Atlantic Telecommunications-8 (TAT-8), went into service in 1988 and can support 40,000 simultaneous telephone calls. Another system being deployed this year, TAT-9, will handle as many as 80,000 calls.

Gregory Staple, a communications attorney at Koteen & Naftalin in Washington, D.C. and an author at the International Institute of Communications in London, said the new optical amplifier technology could usher in an era in which capacity constraints are called into question.

"Users will have much greater international telecommunications options in four years when this new technology is employed," he said. "That will be the period when there's a real possibility of a mass market for some multimedia applications."

Staple said the technology will also increase pressure on vendors to bring to market a new generation of multimedia terminals that can take advantage of the error-free transmission and wider bandwidth that will be available at attractive prices. ◼

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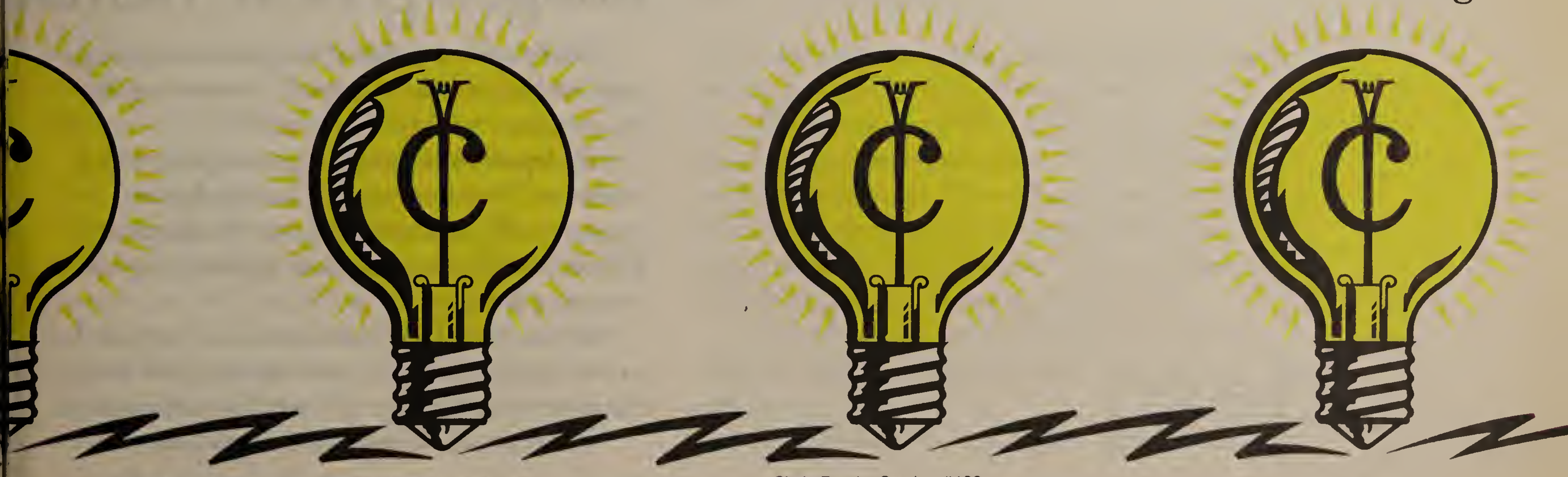

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First Look

Ethernet adapter ties machines to NetWare LAN

3Com Corp. last week announced a new Ethernet adapter for connecting personal computers or diskless workstations to a Novell, Inc. NetWare local-area network.

3Com's **NW1000** is an 8-bit Ethernet adapter bundled with drivers for NetWare 2.X and 3.X network operating systems.

The NW1000 also features a NetWare boot programmable read-only memory, which provides remote start-up of diskless workstations or personal computers. This feature will especially appeal to network administrators who prefer remote booting of LAN nodes for increased security and software administration purposes, the vendor said.

The NW1000 plugs into the expansion slot of IBM Personal Computer ATs or XTs, as well as Personal System/2 Model 25s or 30s. It supports a thin coaxial cable connection to the network and features menu-driven configuration and diagnostics.

The NW1000 is available now for $239 per board when purchased in a five-board package or for $289 in single-board quantities.

3Com Corp., 3165 Kifer Road, Santa Clara, Calif. 95052; (408) 562-6400.

Bridge links NetWare LANs over DDN

Frontier Technologies Corp. recently announced a remote bridge that links Novell, Inc. NetWare-compatible local-area networks over the X.25 packet-switched Defense Data Network (DDN).

Frontier's **Super-DDN Bridge for NetWare** is a single board that fits into a slot on any Extended Industry Standard Architecture or Industry Standard Architecture server running Advanced NetWare 2.1 or higher.

The bridge is capable of linking a single NetWare LAN to the DDN. Although the device comes with two X.25 ports, a company spokesman said on-board software is only configured to support a single X.25 connection.

The Super-DDN Bridge for

(continued on page 36)

Pack of PC utilities gets net features

BEAVERTON, Ore. — Central Point Software, Inc. recently announced a new release of its PC Tools package of microcomputer utilities that includes several networking enhancements.

PC Tools 7.0 has a new Microsoft Corp. Windows-like user interface that simplifies the use of utilities designed to enable microcomputer users to do everything from backing up data to recovering corrupted network files and guarding against viruses.

Just as earlier versions of the product helped users recover corrupted microcomputer files, among other things, the net enhancements in Release 7.0 can be used to locate network files in Novell, Inc. NetWare local-area networks by using standard NetWare attributes and "undelete" files on network drives.

PC Tools 7.0 includes three new Windows 3.0 applications that enable users to back up, recover and initiate any Windows or DOS application or file.

The product's System Information utility has also been enhanced to enable users to access information on as many as 160 systems and network parameters. These include the manufacturer of the network operating system in use, version and release numbers; a list of local and bridged servers; disk volume data for each server; users supported by each server; the ability to send "chat" messages to users; and usage reports showing the amount of server space per user.

New with Release 7.0 is Central Point Commute, an application enabling users to take control of a remote personal computer, whether for diagnostic purposes or to enable traveling personnel to check in for electronic mail messages or other network services.

Central Point Commute features predefined modem configurations and a Windows-like user interface to simplify product use. To prepare an office microcomputer to receive calls, the software is loaded and the "Wait for call" selection is chosen from a menu. The remote user similarly loads Central Point Commute and selects the "Call and take control" function. Once linked, the user can perform any function on the remote microcomputer that can be accomplished locally.

(continued on page 36)

Shiva network server links remote PCs, Macs to LAN

By Maureen Molloy
Staff Writer

CAMBRIDGE, Mass. — Shiva Corp. last week announced a communications server that enables remote IBM-compatible personal computers and Apple Computer, Inc. Macintoshes to dial into Novell, Inc. NetWare and AppleTalk networks.

NetModem/E is a stand-alone device that connects to any standard Ethernet local-area network and handles incoming and outgoing communications with remote personal computers.

It comprises a 10-MHz Motorola, Inc. processor, a Hayes Microcomputer Products, Inc.-compatible V.32bis/V.42bis modem, an Ethernet adapter, and resident Novell Internetwork Packet Exchange (IPX) and AppleTalk protocol stacks.

NetModem/E enables remote users to dial into the LAN and log onto the network as if they were accessing the server from a local workstation.

Unlike existing dial-in products that use remote-control software to transfer keyboard and mouse input as well as screen images from the remote device to the LAN server, NetModem/E transfers LAN packets over the telephone line, enabling users to operate as if they were locally attached to the LAN server.

James Harrison, program director of global networking strategies at the META Group, a consultancy in Westport, Conn., said the NetModem/E differentiates itself from current low-end communications servers in that it gives remote users network connections without an intervening file-transfer program. Because the product has a built-in file-transfer feature, remote users can access multiple servers with a single dial-up connection rather than having to log off and dial in to access another server.

Shiva said the product will have the greatest appeal to business travelers, telecommuters and users in remote branch offices. The vendor pointed to an International Data Corp. study that predicts a surge in worldwide portable computers from nearly three million in 1990 to more than eight million in 1994.

(continued on page 36)

Data delivery system now supports LANs

XcelleNet's Remote Applications Mgmt. System can distribute data to thousands of LAN devices.

By Paul Desmond
Senior Editor

ATLANTA — XcelleNet, Inc. recently announced a new release of its Remote Applications Management (X/RAM) System, which enables the personal computer-based automated data delivery and collection system to support remote local-area networks.

X/RAM is a package of software products that can be used to manage the flow of data to thousands of remote microcomputers or point-of-sale terminals via dial-up lines, such as in software distribution applications. The software package also supports the collection of data from such devices.

The heart of X/RAM is its Network Manager software, which runs under OS/2 on Intel Corp. 80386- or 80486-based personal computers.

Network Manager is used to schedule and establish communications sessions with remote microcomputers or POS terminals running X/RAM's client software, dubbed X/Node.

With Release 1.3 of X/RAM, the Network Manager software is enhanced to support communications with remote Network Basic I/O System-compatible LANs. This enables X/RAM to be used as a LAN software distribution tool, according to Joe Owen, product manager for XcelleNet. It can also be used to support the automated delivery of data on a scheduled basis.

The Network Manager software is enhanced to support communications with remote NETBIOS-compatible LANs.

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Support for X.25 nets has been enhanced in Release 1.3 with support for Eicon Technology Corp.'s EiconCard adapter, which lets Network Manager access an X.25 network without an external packet assembler/disassembler.

Also in Release 1.3, X/RAM's graphical user interface has been enhanced to support movable and sizable windows, user-selectable color schemes, and user-definable menu and window configurations. Context-sensitive help screens are now available as well.

According to Robert Zack, vice-president of marketing at XcelleNet, the graphical interface helps separate X/RAM from mainframe-based software distribution or collection systems.

The interface not only makes it easier for users to tailor X/RAM to their needs, it makes the system easier for remote users to utilize.

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The interface not only makes it easier for users to tailor X/RAM to meet their needs, it also makes the system easier for remote users to utilize. That is especially important because X/RAM users include major retailers, convenience stores and fast food chains that have nontechnical staff in remote sites, Zack said.

Another enhancement with Release 1.3 is new application program interfaces (API) that make it easier for users or third-party vendors to write applications that work with Network Manager.

The APIs can be used to write programs that communicate with host-based applications via any session type supported by OS/2, including IBM 3270 and LU 6.2/Advanced Program-to-Program Communications.

Release 1.3 of the Network Manager software will be available this month. It costs $5,995 for a system that supports as many as 50 remote personal computers, $11,995 for up to 400 remote systems and $19,995 for more than 400 remote devices. LAN and X.25 support options cost $2,495 each.

For additional information, contact XcelleNet at 5 Concourse Pkwy., Suite 200, Atlanta, Ga. 30328, or call (404) 804-8100.

Server links remote PCs, Macs to LAN

continued from page 35

This increase — coupled with the expansion of LANs and LAN applications such as electronic mail, groupware and client/server data bases — will magnify the need for remote dial-in products, the company said.

Harrison said the META Group is interested in beta-testing the product for Shiva since many employees travel frequently or work from their homes.

"Currently, workers on the road must dial in separately to access each of our three servers. With NetModem/E, they'll be able to dial in once to access the entire network," he said.

In addition to dial-in capabilities, the server can establish a routing connection between geographically separate networks and perform dial-out functions.

> The server can establish a routing connection between geographically separate networks and perform dial-out functions.

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The product's dial-out capability allows any authorized user to connect to bulletin boards or information services such as the Dow Jones News/Retrieval Service without requiring a dedicated modem and phone line for each user.

By using a NetModem/E at each end of the link, companies will be able to connect LANs in order to share data resources. In addition, the product supports IPX and AppleTalk protocols and automatically recognizes the protocol in use without requiring user configuration.

NetModem/E is compatible with DOS, Macintosh and Microsoft Corp. Windows platforms.

Under optimal conditions, the NetModem/E provides transmission speeds up to 58K bit/sec as a result of a 14.4K bit/sec V.32bis base transmission speed combined with up to a fourfold compression using the standard V.42bis protocol.

The server costs $2,299 and begins shipping next month.

For more information, contact Shiva, 1 Cambridge Center, Cambridge, Mass. 02142, or call (617) 252-6300. ▣

Pack of PC utilities gets net features

continued from page 35

If the office microcomputer is on a LAN and outfitted with a second copy of Central Point Commute, the remote user can launch the second copy and use it to access other office-bound personal computers running the software. Each copy of the software comes with a license to run the program on two machines.

Central Point Commute access can be controlled by a password, a callback option and individual security profiles. The software runs on microcomputers with 640K bytes of random-access memory running DOS 3.3 or later. The LAN has to be running NetWare 2.15 or above, or NetWare 386.

Other new or enhanced utilities included in Release 7.0 are:

- **Virus protection** — Provides automatic virus detection of 600 known viruses on local and network drives.
- **FileFind** — Enables users to view 35 programs in their native format and checks for duplicate file names on a disk.
- **Undelete** — Recovers deleted files on a local microcomputer or network drive and enables the user to view the file in its native format prior to undeletion.
- **Directory maintenance** — Displays network rights and attributes for net files in a graphic format and allows users to rearrange the directories using a mouse.

PC Tools 7.0 is scheduled to be available this month for $179. Through July 31, 1991, registered users of all prior versions of the product will be able to upgrade for $49. Competitive products can be traded for PC Tools 7.0 for $59.

For more information, contact Central Point Software at 15220 N.W. Greenbrier Pkwy., No. 200, Beaverton, Ore. 97006, or call (503) 245-0905. ▣

First Looks

continued from page 35

NetWare encapsulates NetWare Internetwork Packet Exchange (IPX) traffic in X.25 format for transmission across the DDN.

At the DDN end point, the X.25 packets are stripped off and IPX data is presented to the NetWare LAN. The bridge can operate in background mode on nondedicated NetWare servers.

Super-DDN Bridge for NetWare costs $6,995 and will ship in June.

Frontier Technologies Corp., 10201 N. Port Washington Road, Mequon, Wis. 53092; (414) 241-7084. ▣

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OPINIONS

ELECTRONIC DATA INTERCHANGE

BY VICTOR WHEATMAN

It's time for EDI project managers to stand and deliver

In difficult economic times, new initiatives are questioned and existing projects — and managers — are at risk.

However, at many companies, programs for implementing electronic data interchange and interenterprise systems based on EDI and electronic funds transfer are being preserved, albeit with decelerating projected budgets. Nevertheless, today's EDI managers must prove how their projects fit with corporate directives to cut costs. And they must do it now.

Three scenarios can occur in interenterprise systems during an economic downturn:

- **Current EDI projects are ended, usually in their pilot phases, because they haven't demonstrated cost savings.** EDI managers are reassigned and the company cuts its losses as it tries to make do with existing paper-based systems and procedures. That situation fuels the recessionary spiral, making the company less productive and less responsive to changes in its market.
- **Corporate departments ask for increases in their EDI investments in an attempt to cut costs.** Unfortunately, the "spend money to make money" argument will likely fall on unsympathetic management ears. Companies that haven't yet invested in EDI should avoid purchasing expensive systems that they may not be able to support. Rather, using personal computers with consolidated site software licenses, or some other kind of centrally coordinated departmental solution, is a more cost-effective approach.
- **Corporations maintain their existing EDI investments.** Using existing staff, companies work to bring on board additional trading partners and to implement new message types. This approach represents the best course of action for cautious corporations. Now is an appropriate time to nurture ongoing EDI programs, making only the incremental expenditures necessary to show a demonstrable return on investment. This endeavor will help the company cut costs and achieve other benefits such as better customer service.

> EDI managers must examine their priorities and trim their less productive activities.
>
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EDI managers should take steps to reduce expenditures in order to avoid having their decisions made for them by the chief financial officer. To survive, EDI managers must examine their priorities and trim their less productive activities. Due to reductions in application maintenance staff, companies may need to change their philosophies regarding packaged software and whether to build vs. buy their systems. If features are needed, influencing the vendor through user groups can be an effective approach.

Alternately, because other information systems projects may be delayed, valuable internal skills may be freed up to work on improving EDI and interenterprise systems projects. The creative manager should access those resources, possibly by using corporate education and training departments to promote applications of EDI and electronic mail.

Additional investments may be justified in a recession to help the company cope. But because most EDI managers have not built a solid business case and demonstrated benefits, it will be difficult to obtain approval for increased budgets. The best survival strategy is to focus the effort where it will do the most good and where results can be shown most quickly.

Wheatman is program director of interenterprise systems at Gartner Group, Inc., based in Santa Clara, Calif.

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EDITORIAL

Users get short shrift from vendors that miss ship dates

Recently, NCR Corp.'s Network Products Division announced it had missed the April ship date for its Open Network System (ONS), the highly touted Open Systems Interconnection-based multiprotocol router that was announced in October.

Yet NCR was strangely mum about why it missed its ship date and why the product wouldn't be delivered until later this year. (Field tests of the product are only scheduled to begin this quarter.) Despite our repeated attempts to glean a more substantial answer, the company would say only that the development effort was more complex and extensive than expected.

When the ONS router was unveiled, NCR officials expounded on the important role it would play in the company's open systems strategy. Both the product and that strategy have won praise from analysts and users, along with a good deal of press coverage. In fact, the ONS announcement received lead news story coverage in *Network World* last October.

NCR owes users a more complete answer about ONS. What was announced with fanfare in October and promised for April cannot be allowed to slide by with no explanation. Users deserve to know what's going on, particularly those struggling to migrate to OSI. For them, ONS represents a promising solution to some pressing problems.

Although NCR is being singled out here, this criticism is leveled at the many vendors that routinely miss ship dates. NCR's failure to deliver on time is by no means unique, nor has the company missed its deadline by a particularly wide margin compared to the margin by which other vendors have missed their ship dates — that is, *if* NCR meets its new schedule.

Unfortunately, broken delivery commitments seem to be the curse of the information technology industry. Perhaps in no other marketplace do vendors so routinely fail to make good on ship dates.

This makes it difficult for users to plan and make their network strategies come to life, which in turn hurts their businesses. In addition, it makes them skeptical of what vendors say, not only about delivery dates, but about product features as well.

Vendors must improve their on-time delivery performance. If this means waiting until a product has been beta-tested before announcing it or committing to a shipment schedule, so be it. Users need an accurate assessment of delivery and not hopeful estimates.

At the very least, vendors that miss ship dates by a considerable margin owe customers an explanation.

OPINIONS

OPEN NETWORK PROVISION

BY ALAN PEARCE

Encouraging competition for the benefit of users worldwide

The competitive dream that began in the U.S. in the 1960s and 1970s and resulted in the breakup of AT&T and the Bell System in the mid-1980s is finally becoming policy in other parts of the world. Of particular note is the European Community's Open Network Provision (ONP).

The European Community is following the U.S. lead, finally embracing competition in the telecommunications marketplace. Soon the 12-nation European Community will implement ONP with the belief that, over time, other nonmember nations such as Japan and some Southeast Asian countries will also adopt and embrace it.

Increasingly, governments worldwide are recognizing that they cannot vest incumbent telecommunications carriers with a monopoly over all telecommunications services.

It appears that the European Community's road map for a 1993 telecommunications marketplace embraces at least some forms of competitive supply of services along with more user control over the network. Competitive ideals were first articulated in the European Community's 1987 green paper on telecommunications, which has since been adopted by the 12 members.

Some of the competitive policies called for in the green paper are:

- **Full liberalization of the terminal equipment market.** This liberalization, which includes fair-type approval procedures to ensure unrestrained provision and interconnection of customer premises equipment, is almost identical to policies mandated by the Federal Communications Commission in the late 1960s and early 1970.

These FCC policies stimulated not only customer premises equipment competition but gave users considerable choice because of a wider array of offerings from the newly competitive equipment market.

- **Liberalization of value-added services.** Launched in the U.S. in 1973, again in response to FCC policy, value-added networks (VAN) were developed to serve data communications users who wanted more or different services than those available from the public network. VANs provide an additional service superimposed upon the basic transmission service.
- **Separation of the regulatory and operational responsibilities of the post, telegraph and telephone administrations.** This separation is an important prerequisite to competitive policies because currently, with the exception of Great Britain, the PTTs are both service providers and regulators. There is no regulatory mechanism overseeing service such as quality and pricing.
- **The opening of markets for satellite receive-only antennas that do not access the public switched telecommunications network.** This policy, also influenced by one first adopted in the U.S. more than a decade ago, permits users who want receive-only satellite dishes to buy them from whichever vendor they please. Such a move reduces the grip of suppliers, which are the sole source of communications equipment and services. Once you abolish the regulatory structure, you lose all control over the market.

Highly developed telecommunications infrastructures will enhance national and international trade and productivity. Open Network Architecture in the U.S., ONP and the opening of the global telecommunications industry will also create ubiquity, a necessary prerequisite to user-friendly information exchanges.

The European Community-formulated ONP is designed specifically to remove both structural and procedural barriers to trade within and between the European Community nations.

However, while similar in its public policy goals to the FCC's ONA, ONP differs in the context and scope under which easier access to the telecommunications network will result.

And unlike ONA, ONP leaves the issue of fostering competition to the individual nation states, a fundamental difference that could lead to problems regarding service availability and pricing. Because the various nation states within the European Community will dictate the rollout of competitive policies, Great Britain's Office of Telecommunications might decide to promote more competitive policies faster than the regulatory authorities in other European countries.

If the industry and users continue to work cooperatively with nation states around the world, it is possible that a global networked environment will exist by the year 2000 that will promote the open exchange of information in most parts of the world.

If that happens, ONP in Europe and Japan, along with ONA in the U.S., will be a valuable precursor to the onset of the information age — voice, video, image and data at any time, any place, in any volume and at a reasonable price.

Is this a dream or is it reality? Changes in policies about adopting competitive solutions to spur the more rapid development of the telecommunications infrastructures will occur slowly, as will the creation of regulatory bodies to oversee the emerging competition.

The dream will become a global reality with real benefits for all only if users continue to participate in the policy-making and political discussions that are currently under way all over the world. ◘

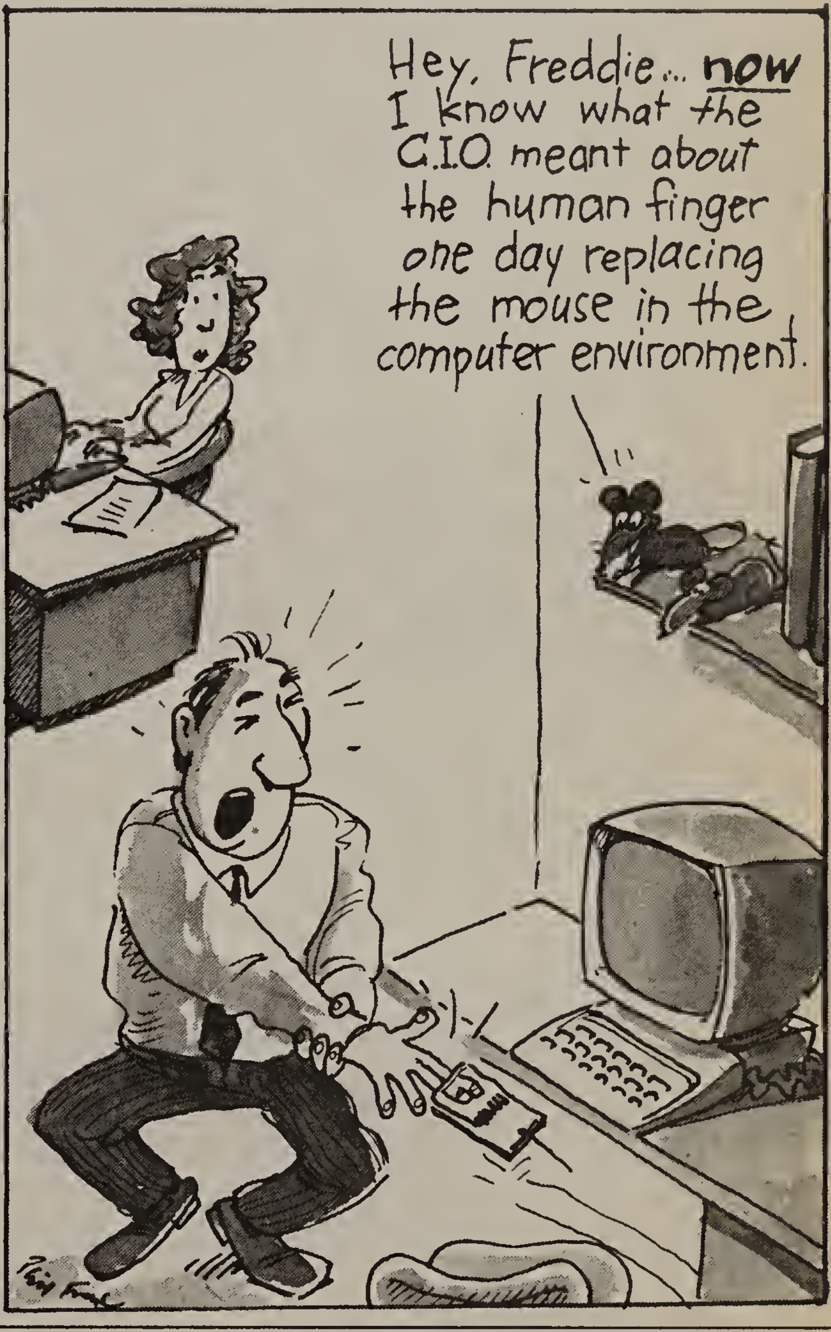
Pearce is president of Information Age Economics, Inc., a telecommunications research firm in Washington, D.C.

LIKE ALLIGATORS IN A SWAMP, unforeseen problems can really put the bite on a communications operation. Many managers find themselves wrestling with these networking reptiles every day.

If you've survived an "alligator attack," share it with our readers by calling Susan Collins, assistant features editor, at (508) 820-7413 or fax your idea to us at (508) 820-3467. Alligators should be 1,200 words in length and submitted either on disk or via modem.

TELETOONS

BY FRANK AND TROISE


Hey, Freddie... now I know what the C.I.O. meant about the human finger one day replacing the mouse in the computer environment.

LETTERS

Another perspective

Your recent editorial "An open letter to FCC Chairman Sikes" appears to come from the perspective of the corporate user. Let me give you the perspective of a competitor.

Competition is great as long as all players are on an even field, which is not the case in the telecommunications arena. Some of the unevenness comes from AT&T's dominance in the marketplace, which, according to some, is at 70% today; more access points to local exchange carriers (due to its prior ownership of these carriers); and the fact that AT&T sells equipment to its Tariff 12 and Tariff 15 customers.

To compete with MCI Communications Corp., US Sprint Communications Co. and other interexchange carriers, AT&T gives huge equipment discounts to companies for which it provides long distance service. To compete with Northern Telecom, Inc., Digital Equipment Corp. and other equipment suppliers, AT&T uses Tariff 12 and Tariff 15 discounts on long-distance service.

No other company in the U.S. has that capability, and now you want to give AT&T more power to control the telecommunications industry.

Full deregulation of AT&T should not come until the other carriers have the opportunity to get their networks in place and their costs under control, and then only if some requirements are placed on AT&T to allow the other carriers to sell AT&T equipment at the same price AT&T offers.

Douglas Hanson
President
Southern Pacific
Telecommunications Co.
San Francisco

Network World *welcomes letters from its readers.*

Letters should be typed and double-spaced. Mail them to Editor, Network World, *161 Worcester Road, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

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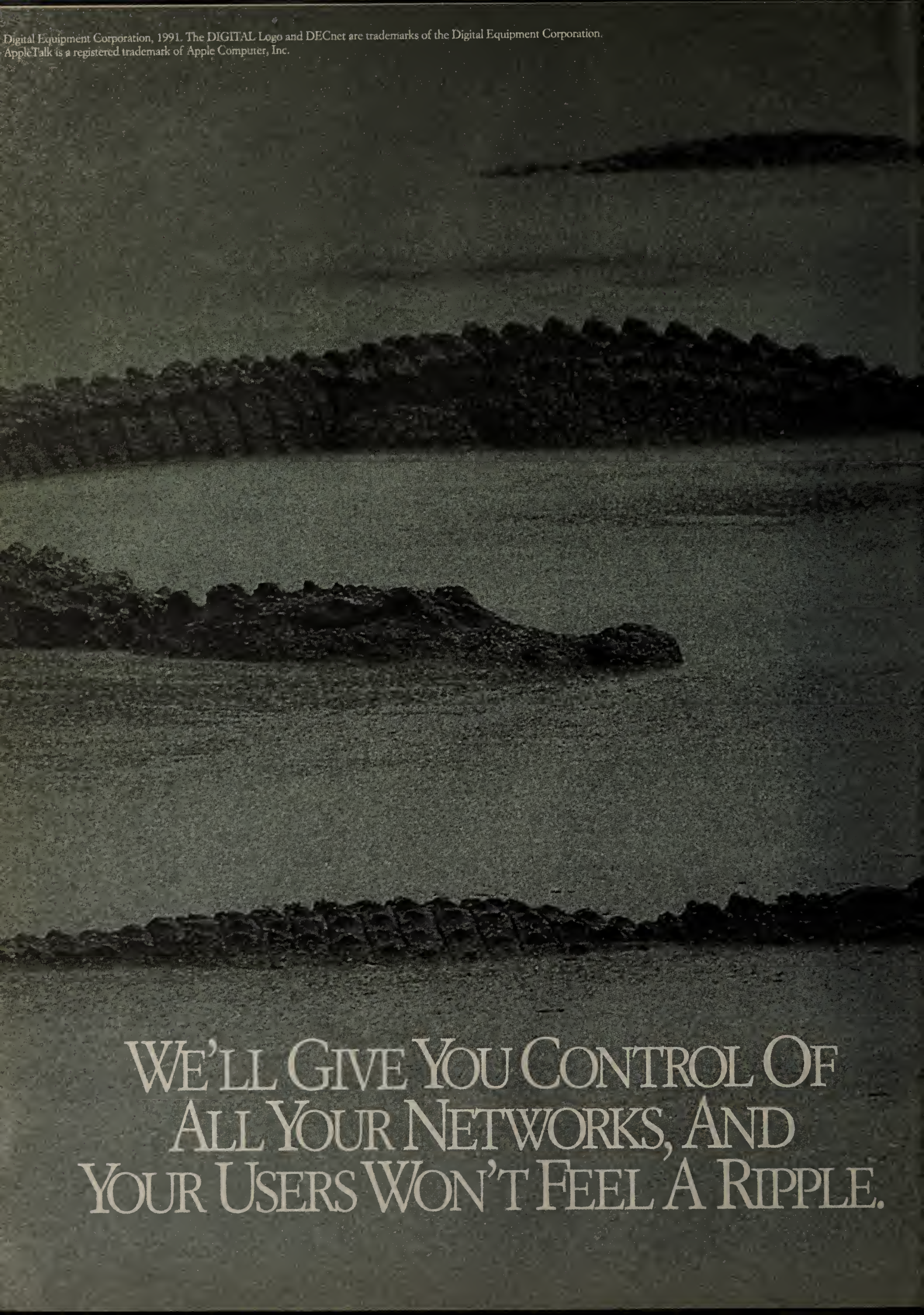

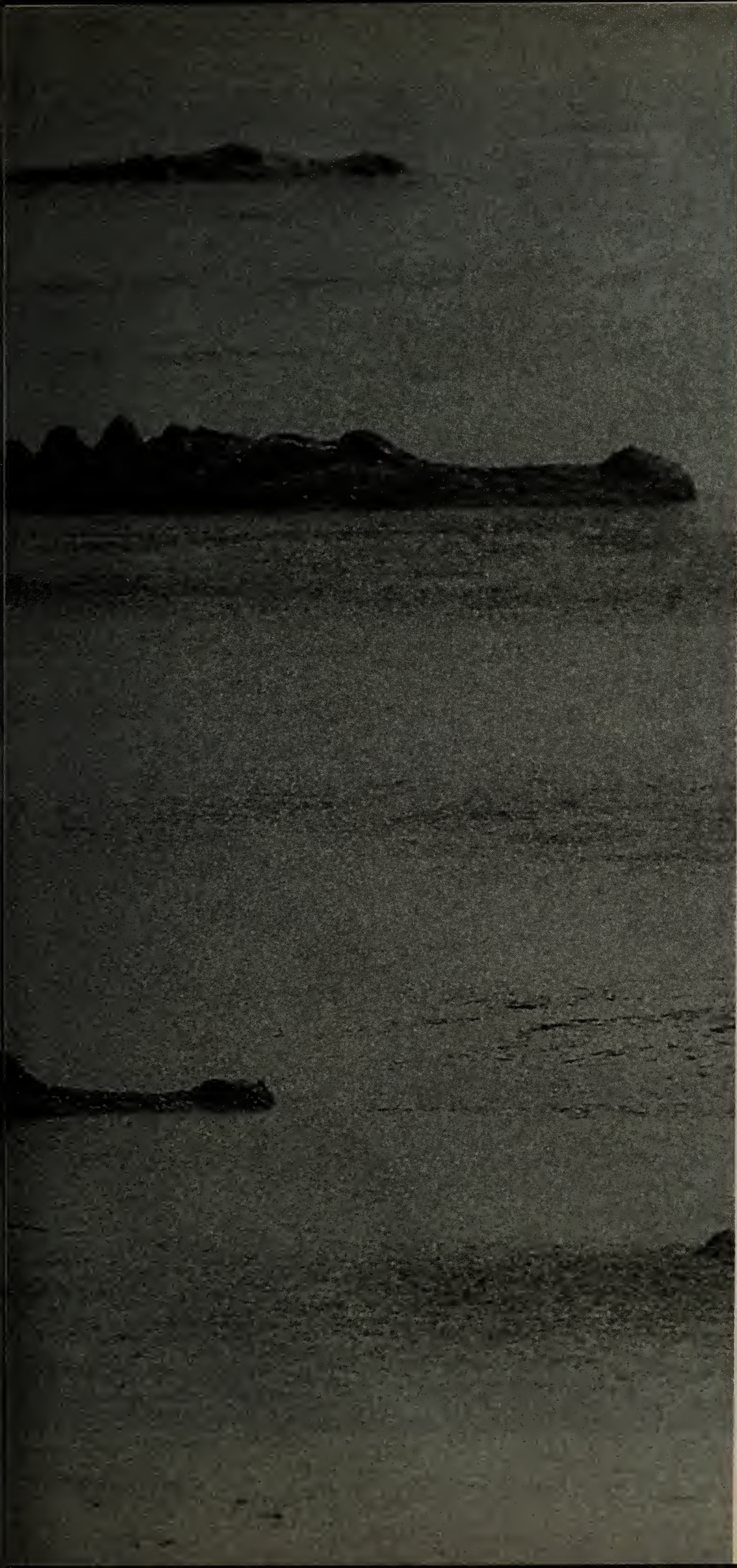

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Trends and TECHNOLOGIES RESHAPING networks:

Security

Lock up your data

By SALVATORE SALAMONE

Only a few years ago, the main goal of network security was to barricade networks against outside intruders. The tools used most often to accomplish this were secure terminals with locks, dialback modems and personal identification numbers.

But those approaches are being questioned in today's networking environment. The industry is moving away from denying physical entry into network resources because this approach often hinders companies from conducting business. In order to compete, most organizations need to provide open access to their networks via electronic mail and electronic data interchange, for example.

Salamone is Network World's *features writer.*

> Maintaining network access while protecting data poses a net security nightmare.

However, such open networks can offer too many tempting targets, leaving net managers open to new security problems.

For instance, network viruses, once merely an annoyance, are causing more trouble for net managers these days (see "Viruses specially made to destroy networks," page 47). And voice network hackers are stealing increasingly large amounts of phone usage through private branch exchange fraud (see "PBX fraud: $500 million per year and rising," page 50, and "Tips for beating voice net hackers," page 50).

The preliminary results of a *Network World* survey of net managers' concerns scheduled to be published in our June 3 issue offer statistics on the extent of network security problems. This telephone survey, based on a random sample of 100 managers, found that during the

(continued on page 47)

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Viruses specially made to destroy nets

Science hasn't cured the common cold after decades of trying. The prognosis, unfortunately, is equally gloomy where the diseases of networking — computer viruses and worms — are concerned.

And the virus situation is worsening. Virus experts predict a trend of virus strains — and other plagues — that are aimed specifically at bringing down networks.

Klaus Brunnstein, a member of the Virus Test Center at the University of Hamburg in Germany, projects that about 100 new viruses and approximately 1,000 mutations of old viruses will emerge during the next 12 months. He says the new threats will be designed to more effectively cause damage to a network.

Experts say that once a virus infects a single networked computer, the average time required for it to infect another node is 10 to 20 minutes. From that point on, the infected nodes continue doubling at the same average rate — four in less than 40 minutes, eight in less than 80 minutes.

With a doubling time of less than 20 minutes (or sometimes faster), some virus strains can wipe out a network in several hours. "I've seen one knock out 300 to 500 nodes of a LAN in five hours," says Peter Tippett, president of Certus International Corp., a Cleveland company that specializes in antivirus software for local-area networks.

"I can name 20 companies that have lost 300 machines in less than three hours," he says. But "no company wants to talk about it because they think it will wind up making their company look bad.

"One of the Big Six accounting firms lost the use of a 300-node LAN to the Jerusalem-B virus for one day, which cost them $70,000," Tippett says. "Just two weeks earlier, it had lost more than 1,000 nodes on a LAN to the Jerusalem-B virus for two days.

"A national shipping company with a 1,500-node LAN lost the use of their entire LAN for three days because it was infected by the Yankee Doodle virus during the week prior to the Fourth of July. They took a scanning product and scanned all of the hard drives and file servers, removing all known instances of all known viruses.

"Their LAN was immediately reinfected by the same virus; within 24 hours of restarting the network, 350 nodes were infected a second time. They called the scanner manufacturer, which told them, 'Well, obviously you missed a spot.' So companies typically scan their equipment two or three times; they just clean it up and hope it doesn't come back," he says.

Examples of new, sophisticated programs written specifically to harm networks include moles — which are destructive programs that reside on a single network node, move to a few others, and then go into a quiescent state for a while before becoming active again.

A sleeping worm would have knowledge of an entire network, periodically checking all network nodes but remaining dormant until triggered by a specific event, such as a date or by the user inputting a certain command. "The question is: How can you detect such animals?" Brunnstein says.

The greatest danger will be from multiple threats — combinations of viruses with worms or with programs called Trojan horses, he says. A Trojan horse is a harmless program that contains some unwanted, hidden or unexpected feature. It can be very small (less than 100 bytes) and, therefore, very difficult to detect.

Worms can be used to distribute viruses and Trojan horses, while viruses and Trojan horses can be used to install worms, for instance. Experts say that in theory, "viral worms" could be created — destructive programs that pass undetected through networked nodes without doing any harm until they find a targeted node. When they do, they install themselves and stop reproducing.

"What we will see in the future is the appearance of more and more complex creatures — more complicated forms of computer life, which will hide better," says Yvo Desmedt, assistant professor of electrical engineering and computer science at the University of Wisconsin-Milwaukee.

And removing the source of infection from a LAN or wide-area network is never going to be easy.

"On a network of 500 terminals, if you power down one at a time, clean each terminal and power it back up, by the time you get to the third or fourth terminal, the first one is reinfected because the network continuously generates the infection process," says Jim McAfee, chairman of the Computer Virus Association and president of McAfee & Co. of Bridgeport, Texas, a manufacturer of antivirus software products.

Fortunately, the experts say that several of the well-known antivirus programs work well on networks. Users should evaluate the products from Symantec Corp., McAfee & Co.'s antivirus programs, On Disk, Inc.'s Quarantine and Certus' LAN 2.0. "And they would probably do well to evaluate IBM Scan 1.3," he says. ◘

— *Kris Herbst*

Herbst is a free-lance writer based in the Washington, D.C. area.

(continued from page 45)

previous 12 months, 19% of the respondents had experienced network security problems caused by unauthorized internal users.

While that figure is about the same as the 18% of network managers surveyed who have had problems with hackers, experts point out that hackers rarely cause much damage.

Most computer and network damage is actually caused by disgruntled employees. And the largest share of financial losses that stem from lost data are caused by a combination of accidents by honest employees and deliberate action by dissatisfied workers.

According to Robert Courtney, a security analyst in Port Ewen, N.Y., more than 80% of all financial losses that stem from lost data are caused by the actions of internal staff (see graphic, page 50). From this finding, experts conclude that security measures must begin from the inside and work outward.

"User companies must protect against their own people first, and in most cases, this protects against hackers and outside people," says a network manager at a chemical manufacturing company who requested anonymity.

The encryption choice

To safeguard their nets from the inside, network managers are paying increasing attention to the encryption of transmitted and stored data. "Encryption is the main tool used to secure nets," says Virgina Lacker, engineering manager at Harris Digital Telephone Systems in Novato, Calif.

Gigi Wang, an analyst at International Data Corp., agrees. "Today, the most common form of network security is the encryption of sensitive data," she says.

Network managers must make a critical choice between two approaches to encryption — what cryptographers call symmetric and asymmetric encryption.

Symmetric encryption uses the same code key to both encrypt and decode data. For example, one symmetric encryption scheme is the well-known Data Encryption Standard, an IBM-developed code standardized by the National Institute of Standards and Technology that has been used in corporate networking for the past 15 years or longer.

The asymmetric approach uses a different key for each function. Of these functions, one key to the code is kept private and, therefore, is called the private key. The other is made available to a group of potential users and is called a public key. Asymmetric encryption methods are referred to as public key encryption, and symmetric encryption is called private key encryption.

An example of public key encryption is RSA Data Security, Inc.'s RSA public key cryptosystem, which was developed in the late 1970s at the Massachusetts Institute of Technology.

In April, a group of vendors, including Digital Equipment Corp., Lotus Development Corp. and Novell, Inc., decided to integrate RSA's encryption technology into their products. Several other vendors are likely to join, including Apple Computer, Inc. and Microsoft Corp.

The advantage to symmetric encryption is that a standard exists that allows encryption devices from different vendors to exchange coded information. The drawback to symmetric encryption is that the encryptor and decryptor need the same key. Therefore, a common key must be distributed with the assurance that no outsiders obtain copies.

On the other hand, public key systems allow the use of multiple keys and give users the ability to generate what are called electronic, or digital, "signatures." These signatures contain a transmitted code, one that only an identified party would know, thus proving the authenticity of the message sender.

"Cryptographic techniques, such as digital signatures, can provide several security services that are not provided by conventional password ID methods," says Michael Baum, president of Independent Monitoring, a Cambridge, Mass., consulting firm specializing in EDI and electronic message system controls and the law.

Nonrepudiation, which prevents a document's originator or recipient from denying that they originated, sent or received a message, is one of the services not provided by conventional means, Baum says. Nonrepudiation is particularly important if the data transmitted could potentially be at issue in a legal dispute, such as one over an order placed via an EDI transaction, for example.

Today, developments in the encryption field are happening at a fast and furious pace. A quick look at recently issued patents shows much activity, particularly in the area of key management.

IBM, for one, has been doing a lot of work in key management and has had a spate of patents issued on the subject during the past six months.

The primary reason is IBM recently announced a new strategic direction in encryption, which it calls its Common Cryptographic Architecture (CCA). CCA defines a set of application-level services and interfaces across all of IBM's encryption offerings.

Standards efforts

EDI and E-mail applications require hard-to-secure open access networks. Therefore, one area of security getting considerable attention is the effort to provide secure messaging.

Several such standards efforts are now under way. For example, CCITT X.402 provides security services as part of X.400. In addition, X.435 will offer secure messaging for EDI, and X.509 will be a secure naming and routing process for a multidomain messaging environment.

Basically, these standards define how to provide security services such as message authentication, data integrity, nonrepudiation, access to data (sometimes called "availability"), and audit and accountability functions.

"The security services defined in the standards provide the link between the [user's] security requirements, and the security mechanisms and management controls to satisfy these requirements," says Ted Humphreys, principal consultant at XISEC Associates, an Ipswich, England, consultancy in information security systems and standards.

The X.402 recommendation, which is well developed, defines 20 services that fall into seven classes, with each service aimed at a particular security threat. For example, a service that provides nonrepudiation of message origin prevents a person from denying that they sent a particular message. Humphreys notes that the method to provide this service is not defined in the standard, however.

As part of the 1992 study period, the Consultative Committee on International Telephony and Telegraphy has been developing recommendations for secure EDI messaging. The result of that work, X.435, which is scheduled to be published in 1992, defines how to send EDI messages using X.400 envelopes. The X.435 standard includes security features for EDI messages based on X.402 security options as well as new options.

One area in which X.435 offers more enhanced security features over X.402 is in EDI message authentication, according to Humphreys. For example, the standard defines services for proof of EDI notification, proof of message retrieval and proof of message transfer.

Implementing the services de-

(continued on page 50)

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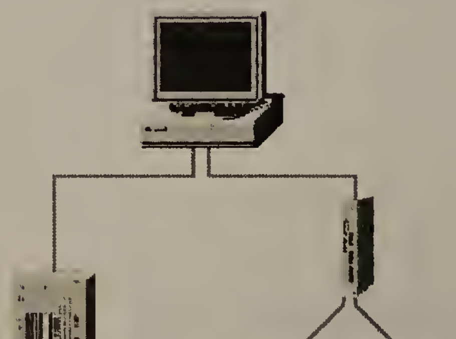

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PBX fraud: $500 million per year and rising

Computer crime and viruses have been around for years, but the trend toward targeted attacks on corporate voice networks is relatively new.

Two similarities between private branch exchange fraud and computer viruses are that both are growing rapidly and mutating into new dangers. One such danger is the potential for the illegal penetration of a voice network through a facsimile machine using either the machine's remote diagnostic capabilities or its polling facilities.

The best estimate of the scale of PBX fraud is available from the Communications Fraud Control Association (CFCA) in McLean, Va., which puts the loss to private networks at $500 million annually. "That's a conservative estimate," says Rami Abuhamdeh, the CFCA's executive director.

The largest reported loss for voice systems was $2.4 million in lost revenue, plus the cost of installing new protective measures, which was incurred by Framingham, Mass.-based International Data Group (IDG) late last year.

Other large PBX crimes were Procter & Gamble Co.'s loss of $300,000 in 1989, Philadelphia Newspapers, Inc.'s loss of $115,000 during one month in August 1989 and the Tennessee Valley Authority's loss of $65,000 in October 1989. A Japanese bank, Sumitomo, lost $300,000 in a single month due to crimes affecting its 47 PBXs, according to Abuhamdeh.

With the exception of the IDG incident, most reported dollar losses from PBX crimes include only the telephone expenditures. Therefore, companies understate the actual dollar cost substantially.

How they do it

Malicious hackers and serious PBX criminals — whose interest is often in reselling long-distance telephone service — use several methods to control a voice network. By dialing in from the outside, they can access a PBX's Remote Access Unit or the Direct Inward System Access (DISA) feature of the network.

DISA is perhaps the most common entry point. Skilled hackers loop in and out of PBXs to avoid line tracing by law enforcement.

Unprotected or poorly protected PBXs make it possible for them to freely attack computer communications, with the PBX owners providing the weapons for attacks on data networks. Thus, by failing to protect its voice net, a company increases the danger of further attacks on itself and attacks on other companies. (For advice on how to protect against such crimes, see "Tips for beating voice net hackers," this page.)

— Ira Hertzoff

Hertzoff is president of Tholian (Holdings), Inc., a Columbus, Ohio, network management and security consulting firm.

(continued from page 47)

fined in X.435 will require the development of technologies defined by another CCITT standard — X.509.

The CCITT incorporated X.509, also known as an authentication framework, into its 1988 X.500 series of directory system standards.

"The X.509 technology is able to play a major part in the realization of many security services," Humphreys says. "In particular, the provision of nonrepudiation services and various authentication and integrity services."

In essence, he says, X.509 can provide the security services defined for E-mail (X.402), EDI (X.435) and directory services (X.500).

However, Humphreys notes that there are other ways to provide these services.

For example, one could use secret-key encryption techniques or message authentication codes. Such techniques are being considered by the ANSI X.12 working group on EDI security structures (X12.58).

When implemented, the security standards will offer safety features for EDI and E-mail environments. However, there are other emerging network security problems that will require new thinking on the part of net managers for securing communications.

For example, changes in the infrastructure of the U.S. public telecommunications network are increasing the threat of damage by hackers.

"With many services, such as switched 56K [bit/sec], switched T-1 and bandwidth on demand, attacks from outsiders will go up," says Stephen Kent, chief scientist at BBN Communications Corp. in Cambridge.

As new telecommunications services roll out, more problems are being anticipated. "There are concerns about ISDN security," Harris Digital Telephone Systems' Lacker says. "With ISDN, the things that are typically considered advantages — ease of access, single access for data and voice, openness and interoperability — are the security dangers."

An example of a Integrated Services Digital Network security breach would be a malicious user initiating a program on a computer that controls a switch or PBX.

"Such a program might instruct the computer to start placing many calls and tie up a company's switch so that no business calls could get through," Lacker says.

But lately, the problem of viruses has become more worrisome than the hackers.

According to the aforementioned *Network World* survey, 32% of the networks of those surveyed had been infected last year with some form of virus. This finding has incited many net managers to seek protection from viruses.

The problem is that there are many new strains discovered each month. In some cases, virus protection software companies are issuing updated versions of their wares monthly.

This has been an issue for many. Net managers have spent countless hours installing antiviral software on each machine and then updating it. But now, new products are reaching the market that allow installation from a central location. For example, Microcom, Inc.'s Virex software contains an Apple AppleShare installer.

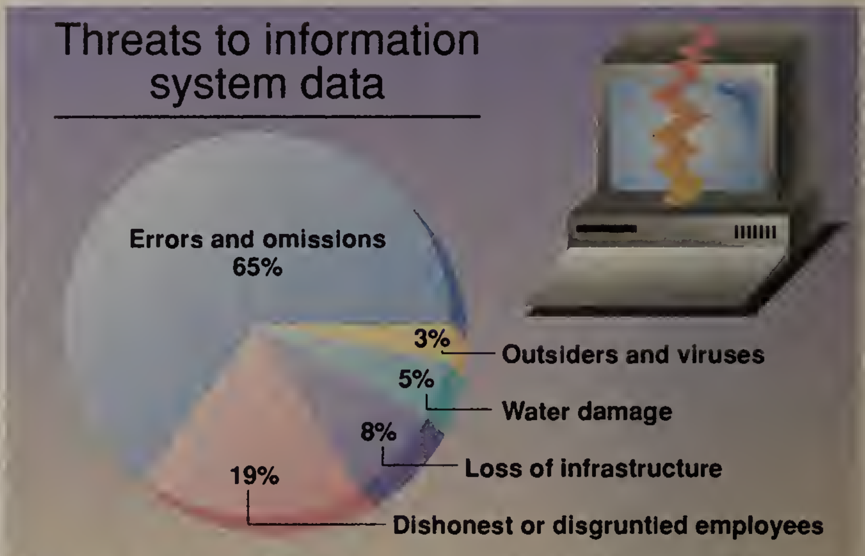
Other new products are likely to follow. For instance, a combination of Microcom's Carbon Copy program and Virex could diagnose files as they are transferred and before they are shared, says Robert Capon, vice-president of Microcom's Utilities Product Group.

Managing threats

Ironically, for most net managers, the biggest battle in network security may be with their own upper management. "Senior management doesn't maintain a sense of security awareness," Kent says. "They have other priorities."

Until net managers can overcome senior management's laissez-faire attitude toward security and win over users who rebel against having to deal with even the barest minimum of network security, the fight to secure corporate networks will be an uphill battle.

In a sense, not only will the threats to security come from the inside, but so will the resistance to security measures.



More than 80% of the damage to computer systems and information security is caused by a company's own employees. However, these figures may underestimate the damage because they are based on only those losses that were reported.

GRAPHIC BY SUSAN SLATER

SOURCE: ROBERT COURTNEY, INC., PORT EWEN, N.Y.

Tips for beating voice net hackers

PBX and voice mail hackers frequently use human error — often an easily available access code or a forgotten trapdoor — as their access point into the voice network.

Therefore, a strong initial barrier to hackers and criminals is essential to network security. Security experts advise that both private branch exchange and voice mail systems be protected at a level equal to their value at the company. In many cases, this is very high indeed since the PBX can provide entry to both voice and data networks.

An ounce of prevention

The first step in strengthening barriers is to increase end-user awareness of the equipment's security features and its vulnerabilities. Insist that your equipment vendor detail both areas. Make sure you understand the optimum access code lengths for the PBX. (They should be at least 10 — preferably 14 — characters long.)

Also, make sure you thoroughly understand the system's capabilities for working with passwords (ideally, you should be able to assign individual, not group, passwords). And the PBX or voice mail system should automatically maintain an audit trail; if possible, it should also have real-time monitoring capabilities.

Be aware of hidden vulnerabilities. One is the remote access port used by the vendor's technicians to adjust and repair system software. This port, in some cases, can be locked up, or it can be made to work only with callback security devices.

Reviewing the records

Illicit entry into a voice network or illegal use of a company's switched telephone services may show up in phone bills.

Premises-based toll fraud often exhibits a clear pattern. At first, there will be a marked increase in 950 outbound and 800 outbound services because the use of these allows hackers to cover their tracks by going from one node to another. Then, as the intruder becomes aware of all the facets of the system, other telecommunications traffic is likely to show a significant increase.

A review of call detail records, both in and out of the system, and periodic matching against expectations can detect patterns of criminal activity. An excellent defensive measure is end-user chargeback. End users can make excellent auditors.

Following are some specific security measures you can take toward eliminating telephone fraud:

- Never let PBX users select their own authorization codes. Create them with random contents, and issue them as needed.
- Use two-stage access codes — a systemwide barrier code followed by an authorization code with the maximum number of digits your PBX can handle.
- Never publish the remote access number.
- Limit remote access trunks to domestic calling. Shut down remote access when it isn't needed.
- If the PBX supports time-of-day restrictions, make sure they are operational. Never assume they are activated.
- Watch for short-duration calls and long strings of call attempts that might indicate hacking.
- Train PBX console attendants, night security officers and remote access users in security and in how to respond if they suspect an intrusion.
- When an illegal penetration of the network is suspected, contact your long-distance carrier first, your PBX vendor next, then your voice mail vendor and finally — if the case falls into federal jurisdiction — the U.S. Secret Service.

— Ira Hertzoff

FEPs face the router challenge

CONTINUED FROM PAGE 1
end, claiming the $80,000 behemoths will be replaced by $20,000 routers.

Router news

The idea of a router that can handle SNA in native mode became news in late January when Cisco announced an agreement with Brixton Systems, Inc., a software company in Cambridge, Mass. Cisco said it would add Brixton's SNA routing software to its line of bridge/routers ("Cisco turns AGS line into SNA routers," *NW,* Feb. 4).

Brixton's BrxSNA/IP software essentially lets a Unix processor emulate SNA PU 4 devices, which are front-end processors. The agreement calls for the two companies to port that software to run on Cisco routers, thus letting the router emulate a PU 4 device and route native-mode SNA data.

Vitalink announced a similar agreement with Netlink, Inc., a Raleigh, N.C.-based manufacturer of SNA products. But Vitalink said its routers will emulate PU 2 devices, such as cluster controllers. PU 2s cannot route data across wide-area networks, although they can operate as bridges. Despite repeated requests, as of press time, Vitalink had not detailed how it would overcome this limitation.

And other vendors are on the trail. Proteon, Inc. plans to support PU 4, says Gary Wood, the firm's senior marketing manager, who notes that Proteon is close to selecting a development partner and plans to bring out a

(continued on page 54)

Less costly than front-end processors, multiprotocol routers with SNA capabilities may be small packages users find irresistible.

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Volume 7, Number 18 — An International Data Group Publication — April 30, 1990

U.S. to study Soderblom token patent

By Laura DiDio
Senior Editor

WASHINGTON, D.C. — In a move that could spell trouble for Olof Soderblom's token-passing patent and monetary relief to his 50 licensees, the U.S. Patent and Trademark Office has agreed to reexamine the validity of Soderblom's patent.

In its 1½ page decision, the Patent Office stated that the reexamination request from an anonymous vendor was granted in view of earlier patents issued to four engineers — including two from AT&T Bell Laboratories — before Soderblom was granted his patent in 1981.

"A substantial new question of patentability affecting Claims 23 to 33 of U.S. Patent No. 4,493,948 to Soderblom is raised by the request," the Patent Office statement said.

The 10 claims in question deal with open and closed data transmission loop schemes and are central to the issue of whether Soderblom's existing patent is applicable to today's token-ring and Fiber Distributed Data Interface local-area network technologies.

Invalidation of the patent or amending even portions of the patent could effectively render null and void the current licens-

(continued on page 62)

What's in a name?

DEC's Distributed Name Service (DNS) process

1. User attempts to store file.
2. Not recognizing name, DNS clerk routes request to DECdns server.
3. Server locates full file name and address, and sends data to workstation.
4. Application appends text to routing information and sends file.
5. Data is stored to Smith file on remote server.

GRAPHIC BY SUSAN J. CHAMPENY — SOURCE: DIGITAL EQUIPMENT CORP., LITTLETON, MASS.

DEC describes benefits of X.500 directory services

X.500 will extend DNS offering to incorporate non-DEC devices in DECnet Phase V directories.

Later this year, Digital Equipment Corp. is expected to announce DECnet Phase V, a major revision of its network software that will support the full suite of Open Systems Interconnection protocols.

According to Jane Brewer, DEC's product marketing manager for enterprise networking within DEC's Telecommunications and Networks Organization, one key component of that announcement will be support for the X.500 directory services standard, which promises to give network administrators greater control over the hardware and software elements in their networks.

In an interview with *Network World* Assistant Managing Editor Charles Bruno, Brewer described the full potential of X.500 directory services and laid out DEC's strategy to support the technology within DECnet Phase V.

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Microsoft to market LAN Manager direct

Software giant to sell NOS to Compaq resellers to stabilize LAN Manager camp, jump start sales.

By Laura DiDio
Senior Editor

REDMOND, Wash. — In an attempt to boost lagging sales of its LAN Manager network operating system, Microsoft Corp. last week announced it will sell a version of the product directly to select Compaq Computer Corp. value-added resellers.

Microsoft's decision to put its marketing muscle directly behind LAN Manager is viewed as crucial if the product is to compete successfully with Novell, Inc.'s NetWare, which commands 60% of the network operating system market today. LAN Manager has only been available through OEMs to date.

"By selling its own version of LAN Manager, Microsoft is giving users freedom of choice," said Craig Burton, executive publisher of the *Clarke Burton Report*, a monthly research magazine. "Users will no longer be constrained to buying versions of the product that only work with a particular OEM's hardware. This will help accelerate the acceptance of LAN Manager."

Jonathan Yarmis, vice-president of the personal computer service at Gartner Group, Inc. in Stamford, Conn., agreed. "The move solidifies and stabilizes the LAN Manager camp and will spur application development.

"Microsoft and its OEMs have to present a unified front, especially in light of Novell's merger

(continued on page 6)

Fax facts

Average:	
Number of users per fax machine	10 to 50
Number of pages transmitted per day	15
Cost per page of transmission	35 cents
Cost per sheet of paper	5 cents
Cost of a fax machine	$1,500

GRAPHIC BY SUSAN J. CHAMPENY

Net execs try to tame fax monster

By Tom Smith
New Products Editor

The explosive growth of facsimile machines has created a costly monster of which few companies are aware, let alone able to control.

Most large companies don't even know how many fax machines they have or how much they are spending on dial-up fax transmissions.

"It's like trying to manage envelopes or pieces of paper," said Bob Craig, vice-president of international network planning for The Chase Manhattan Bank, N.A. in New York. "People don't think it's worth the cost of managing it."

Yet the costs can be staggering. Annual transmission costs can be in the tens of millions of

(continued on page 8)

NETLINE
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AT&T TRIDOM plans to trial a pan-European VSAT network with two users. Page 2.

A TARIFF IS USER is the loser in a heated battle between MCI and AT&T. Page 2.

VENDORS AIMING for FDDI interoperability form a testing consortium. Page 2.

3COM ELECTS Benhamou to the post of president. Page 4.

AMEX AWARDS MCI with a service contract that could be worth up to $100m. Page 4.

US SPRINT EXTENDS VPN services into international markets. Page 4.

PRIVATIZING TELECOM in Eastern Europe is a question of capital. Page 43.

NEWSPAPER

FEATURE
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Telecom privatization will aid int'l users

By Norman Lerner
Special to Network World

Most countries — industrialized, developing, capitalist and socialist — are at some stage of restructuring their telecommunications systems in order to accommodate and take advantage of the great political and economic changes now sweeping the globe.

In many places, this restructuring is taking the form of privatization of formerly nationalized telecommunications systems. This important trend raises major questions for multinational users of telecommunications services, including: Where is this happening and why? How will it affect the way we do business? And what will be the long- and short-term effects on telecommunications services to and from these countries?

This article examines the trend toward privatization in

(continued on page 38)

The results are in and **Network World** is the clear leader. The 1990 Wall Street Journal/ICA Member Study is conducted among members of the prestigious International Communications Association (ICA), an organization whose representatives purchase $16 billion of information technology products and services each year.

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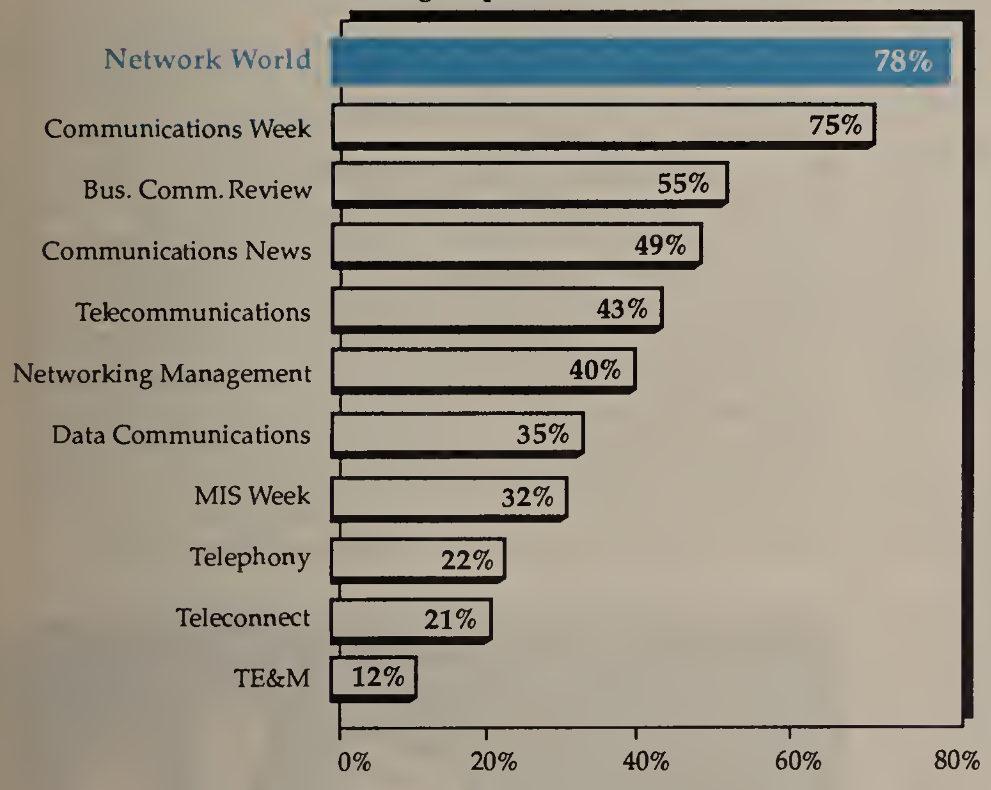
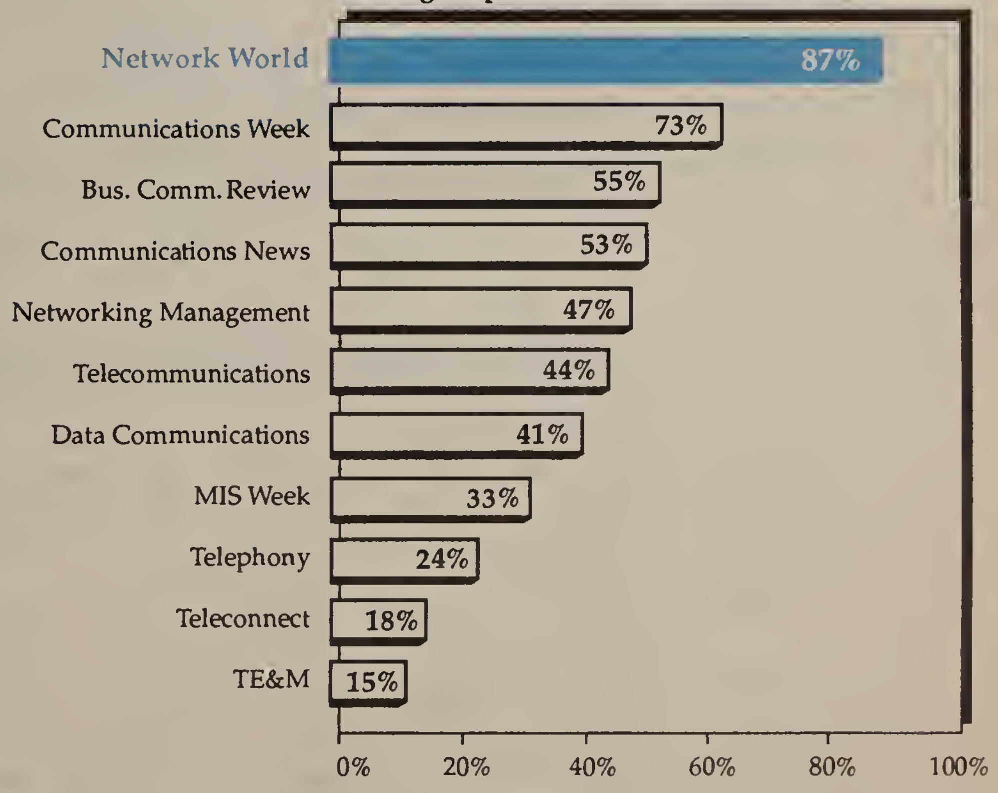


Base: 336 Respondents
Regular readership is at least three out of four issues.

International Regular Readership

(Among Respondents with International Networks)



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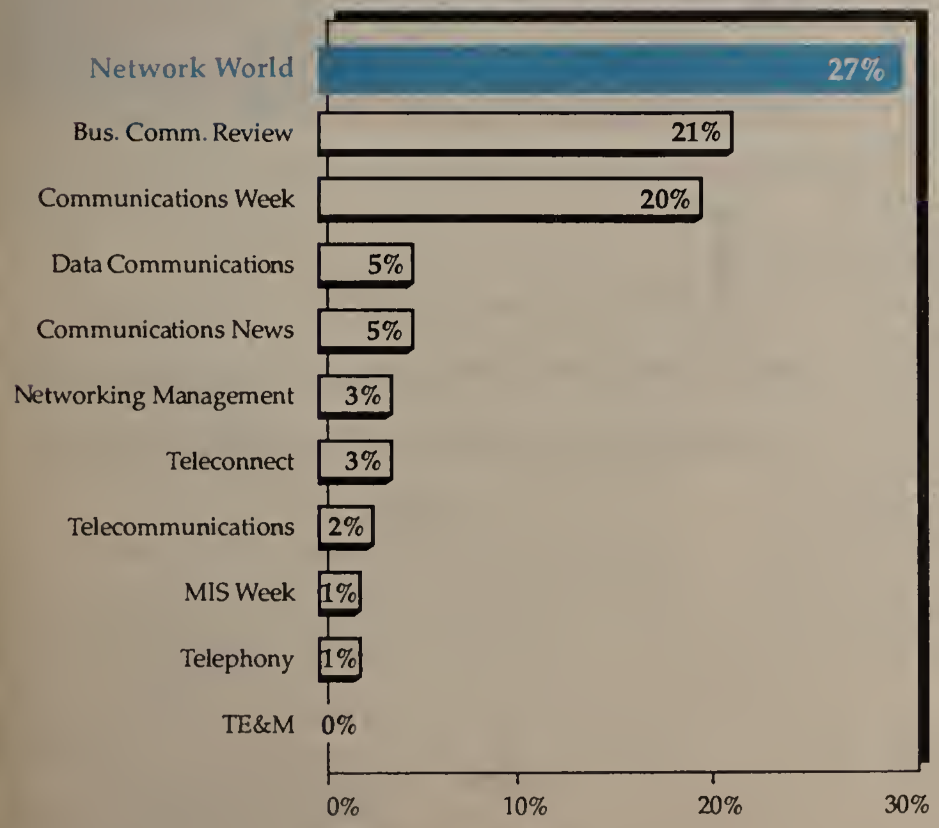
(Among Respondents with Domestic Networks)



Base: 336 Respondents

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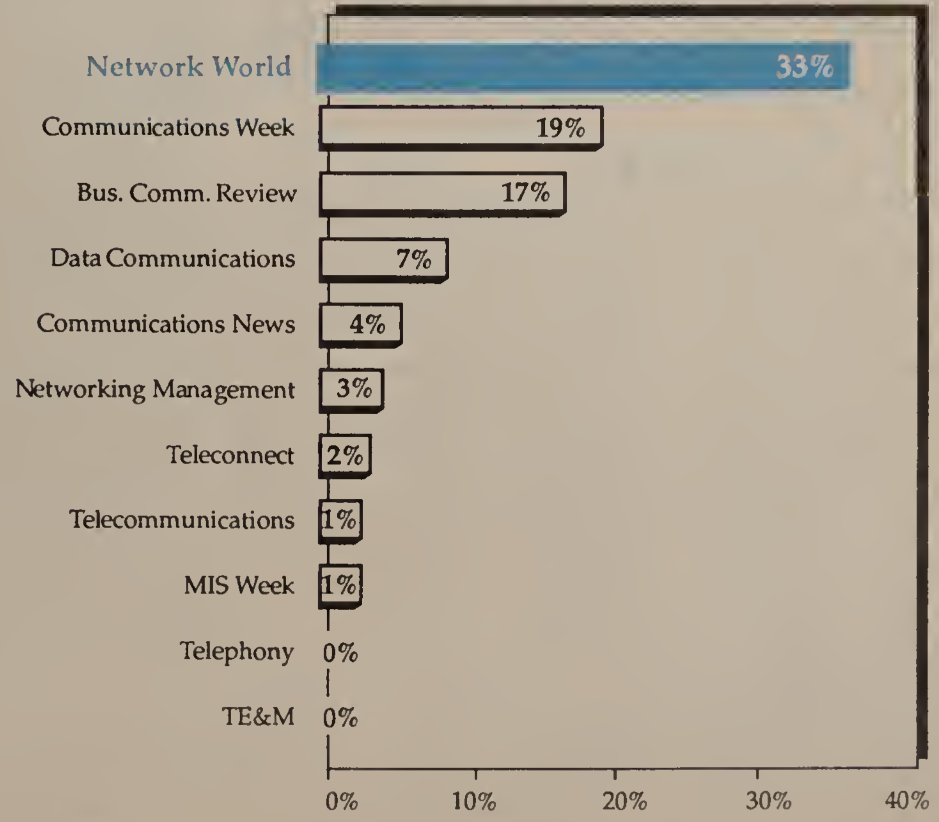

Base: 165 Respondents

Source :1990 Wall Street Journal / ICA Member Study

(continued from page 51)

product in the 1992 time frame. And then there is SNA's parent, IBM, which does not sell a router.

IBM today handles inter-LAN traffic in two basic ways. One method uses cluster controllers or front-end processors as bridging devices. For example, a 3174 cluster controller, a front end with a LAN adapter and gateway software running on DOS or OS/2 machines take packets from the LAN and put them on the WAN. In performing this task, the front end or cluster controller strips the LAN's data packets of their token-ring or Ethernet headers and puts in a Synchronous Data Link Control header.

The other IBM approach uses source routing-based bridges to link LANs to one another. This requires no involvement of VTAM or Network Control Program (NCP). Source routing generates an inordinate amount of overhead in large networks and is limited in the number of nodes that can be traversed before reaching the ultimate destination.

But there are signs that IBM realizes that neither approach is ideal and that it needs, first of all, a router and then most likely one with SNA capabilities. IBM is expected to announce an agreement with Wellfleet Communications, Inc. that would add a multiprotocol router to the IBM arsenal ("DEC and IBM cutting deals with leading router firms," *NW,* April 1). Although neither IBM nor Wellfleet would confirm that a deal is in the works, sources say one is under way.

Another bit of confirmation comes from Jon Fjeld, product manager for network routing systems in IBM's Communication Systems Division, who says, "It's important to us to extend our networking solution to be able to do multiprotocol routing."

"I think this is a death knell for the remote front end," Mohen says.

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Fjeld declined to say whether IBM's multiprotocol router would be configured as a PU 4. But it stands to reason that if any vendor could produce a PU 4-compatible router, it would be IBM. That's because IBM holds the keys to its highly complex NCP and to the host-based VTAM, which are also the keys to SNA routing.

What makes SNA routing difficult for other vendors to emulate is that there are a number of protocols used to conduct handshaking between NCP and VTAM, such as to bring up NCP, maintain physical circuits and activate SNA's physical units.

Over the past few years, NCP and VTAM have become more complicated in order to support LANs and peer-to-peer links associated with IBM's LU 6.2/Advanced Program-to-Program Communications protocol.

"In the last three or four years, IBM has gone through about six or seven releases of VTAM and NCP," says Atul Kapoor, vice-president of Kaptronix, Inc., a consultancy in Haworth, N.J. And he points out that "There is no requirement within IBM to ensure that other vendors can implement those changes, too."

IBM makes no bones about telling users that if they implement a PU 4 from another vendor, they do so at their own risk.

Fortunately, the task of emulating PU 4 is simplified in one way: A router that is PU 4-compatible may not have to perform all the same functions as a front-end processor (see Figure 1, this page).

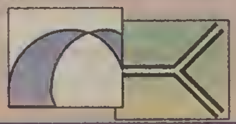
First, an SNA-compatible router isn't likely to be used as a local front-end processor. Local front ends attach to one or more mainframe channels via a bus/tag cable and act as a traffic cop for the sometimes hundreds of terminals, printers and other devices vying for mainframe resources. There is no reason for a router to support that function.

Comparing router and FEP functions

Figure 1

Multiprotocol bridge/router supports:

- Routing at Layer 3 for major LAN protocols
- Wide-area protocols such as X.25 and frame relay
- Bridging for nonroutable protocols such as Digital Equipment Corp.'s Local Area Transport
- Multiple bridging methods such as transparent and source routing
- Multiple LAN and WAN media (Ethernet, token ring and T-1)
- Conversion among different types of media
- Confining traffic to requisite segments of an internetwork
- Prioritizing data traffic
- Dynamic rerouting over alternate links
- Use of parallel links for load sharing and extra bandwidth
- Remote diagnostics, configuration and repair



IBM front-end processor supports:

- SNA Class of Service - session prioritization
- Error control
- Data and session routing
- 4M/16M bit/sec token-ring attachment
- Transmission groups
- Explicit and virtual routes
- Concentration of data lines
- Flow control
- Pacing
- Polling
- SNA Network Interconnection
- Network Control Program Packet Switching Interface — X.25 support
- X.25/SNA Interconnection — X.25 over SNA
- Network management, including modem diagnostics and bidirectional NetView support
- Channel connection to a maximum of 16 mainframes

SOURCE: CISCO SYSTEMS, INC., MENLO PARK, CALIF., AND IBM, ARMONK, N.Y.
GRAPHIC BY SUSAN SLATER

This leaves the remote front ends, which some analysts and users — but not necessarily Cisco — expect the PU 4 router to replace.

But if creating the PU 4 capability implies the ability to replace front ends with routers, why does Cisco say it is not seeking to replace front ends?

"We don't want to compete directly with IBM," says Don Listwin, product line manager for routers at Cisco. "We are, rather, trying to provide a tool that doesn't exist in the overall [SNA] hierarchy."

This tool, he says, will be a router that can handle SNA along with the 15 other protocols that Cisco's AGS+, CGS, IGS and MGS routers support. "Plus multimedia [topologies] like FDDI, token ring and Ethernet," Listwin adds.

Despite what Cisco says, analysts and users say they believe a PU 4-capable router could replace remote front ends. "I think this is a death knell for the remote front end," says Joseph Mohen, vice-president at Teleprocessing Connection, Inc., a consultancy in Locust Valley, N.Y.

"Effectively, [if you have a PU 4 router] you can trash the remote front end for about $20,000," Mohen says. "The remote front end costs about $80,000, and it doesn't do half as much as the multiprotocol router is going to do." That's because a remote front end cannot support nearly as many protocols as the multiprotocol router, he says.

The smallest IBM front ends — the 3745 Models 130, 150 and 170 — range in price from $20,600 to $25,750. Add to that various peripherals such as adapters and scanners, which can cost as much as $20,000 each, plus the required NCP software. "You never end up spending less than $80,000," Mohen says.

The largest Cisco routers, by contrast, start at about $15,000 for a usable configuration.

David Passmore, a partner with Ernst & Young's Network Strategies, Inc. consultancy in Vienna, Va., agrees that a router that supports PU 4 could replace remote front ends. But he doesn't expect this will greatly hurt the business of the IBM-compatible front-end processor vendors, such as Amdahl Corp., IBM and NCR Corp.'s Network Products Division (which includes the former NCR Comten). The reason is that more than 90% of their front-end sales are for channel-attached units, Passmore says.

Some users are also looking forward to having PU 4-compliant routers.

"We could then begin to explore using our large Cisco routers as perhaps distributed 37X5s," says Dan Tonelli, senior systems consultant with Fidelity Systems Co., the technology arm of Fidelity Investments in Boston. "I think there could be some significant cost savings."

Other users say the PU 4 capability in routers would not change their plans much. But that is mainly because they are already moving away from traditional hierarchical SNA.

"Devices that handle SDLC lines are not a hot button with us because we're moving more to LANs," says Robin Layland, telecommunications manager in the data processing department at The Travelers Corp., an insurance company in Hartford, Conn. Most of the new applications The Travelers is deploying are based on LU 6.2/APPC, Network Basic I/O System or other LAN protocols and do not require NCP, he says.

When pressed, Cisco admits that although it may not seek to compete with IBM's front-end processors, it wouldn't rule out that possibility.

Cisco admits that although it may not seek to compete with IBM, it wouldn't rule that out.

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"It's not true that we'd never replace a front-end processor; it's just that we didn't position ourselves as a replacement of the 3745," says Bing Liao, product marketing manager for IBM products at Cisco. The 3745 Model 150, for example, seems a prime target for replacement by a PU 4-capable router. It can support as many as 16 communications lines, two token-ring connections and one T-1 line.

IBM is expected to announce an agreement with Wellfleet that would add a multiprotocol router to the IBM arsenal.

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The larger 3745 Models 210 and 410, with a base price of more than $125,000, can support nearly 900 communications lines and will not be threatened by a multiprotocol router.

But a router with PU 4 capability could extend the reach of an

(continued on page 65)

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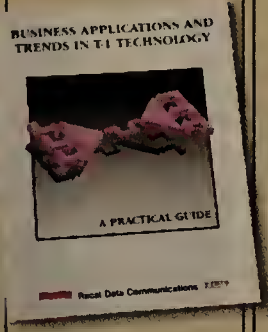
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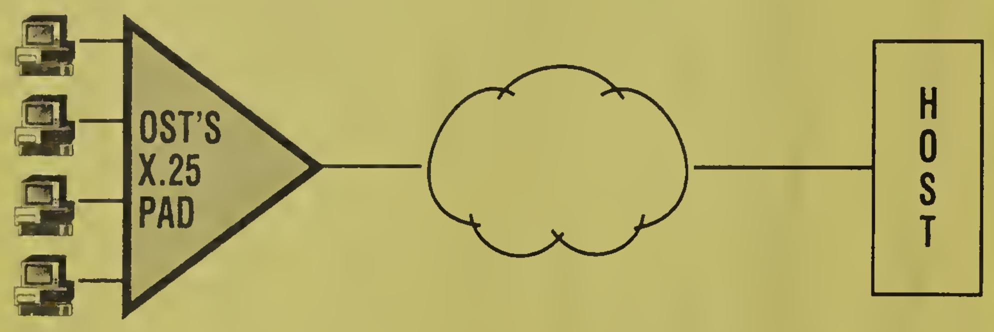

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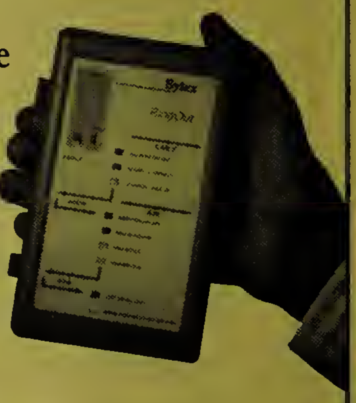

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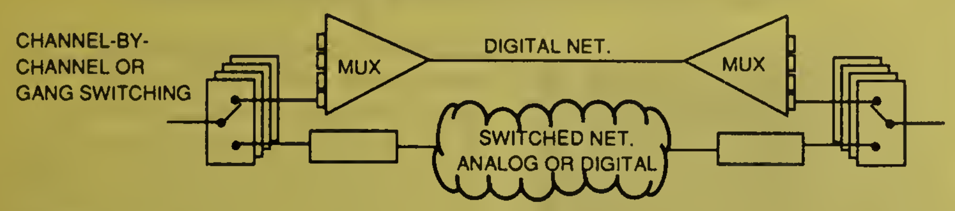
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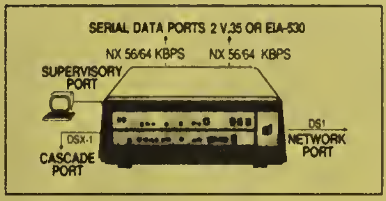

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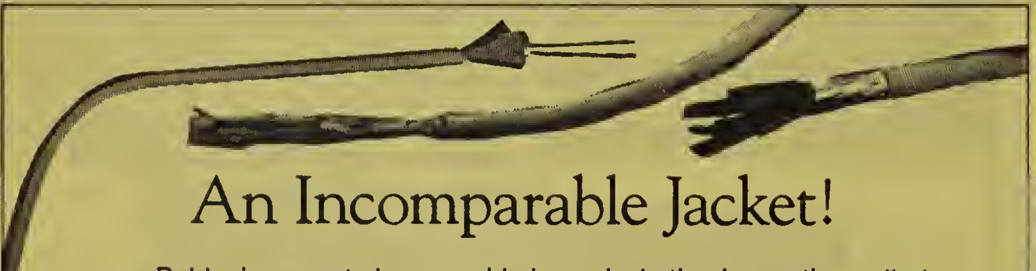

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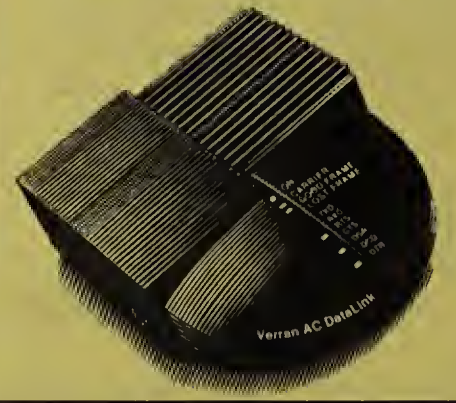

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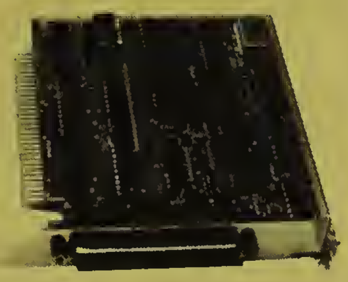

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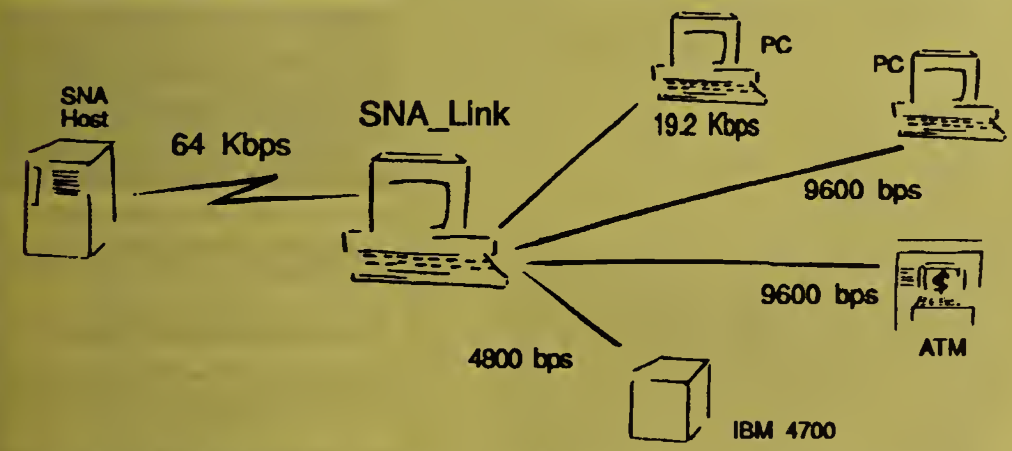

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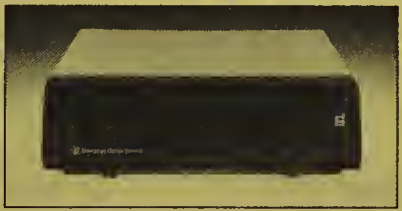

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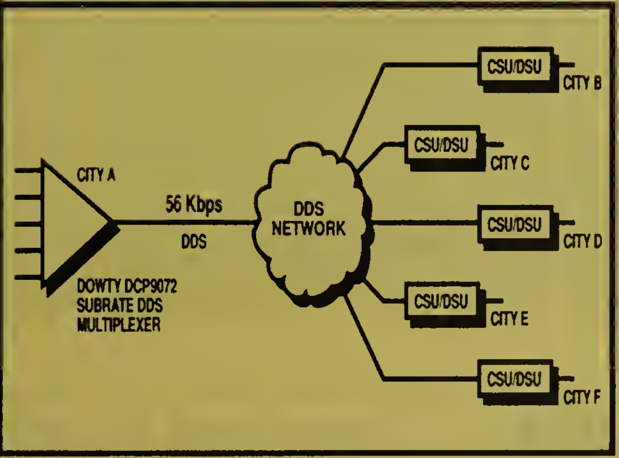

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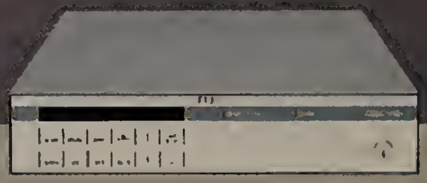

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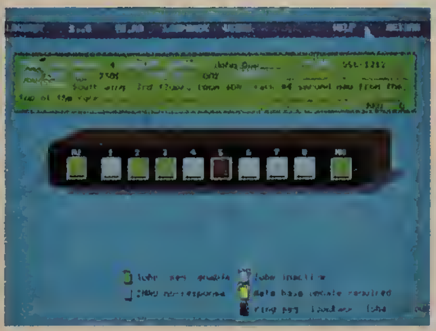

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The router challenge

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SNA network to locations where it previously was not cost-effective, Liao says.

In addition, Cisco will not pitch its router as a front-end replacement because it does not intend to support numerous front-end functions. Among the capabilities Cisco will not support are channel attachments and IBM's SNA Network Interconnection, which is an NCP function for interconnecting separate SNA networks.

But, unlike a remote front end, the Cisco router could serve as a dual-purpose machine, simultaneously supporting both wide-area SDLC links and multiprotocol LAN traffic.

If the SNA traffic supported were strictly 3270-based applications and there were only one host, then the SDLC tunneling or synchronous pass-through capabilities supported today by Cisco and other vendors would suffice.

With SDLC tunneling, also known as synchronous pass-through, SDLC packets coming from a PU 2 device such as a 3174 cluster controller are encapsulated in a routable protocol, such as the Internet Protocol. This enables the router to beat the limitation in SNA routing that requires a new session to be established whenever a communications line goes down or a node fails.

The encapsulation technique lets the router vendor apply the same rerouting capabilities to SDLC packets that it uses for the LAN protocols it supports.

The limitation is that the encapsulation technique supports only point-to-point connections. So if a 3174 needs to communicate with more than one host, it needs multiple connections to the router (see Figure 2, this page).

The PU 4 edge

By contrast, a 3174 with a single connection to a PU 4-capable router could send data to any host in a multihost network.

Ernst & Young's Passmore cites other advantages the PU 4 capability would offer. First, routing in native mode takes less overhead. Essentially, you avoid double-packetizing the data — once in an SNA packet with its associated routing overhead and again in a protocol such as IP with more routing overhead.

Second, PU 4 support gives users more control over how the data should be routed. Different SNA classes of service can be applied, which means various types of traffic can be assigned different routes through the network, depending on how critical each is, Passmore says.

Liao adds that the Brixton-Cisco agreement calls for development of a network management interface to IBM's NetView. When the PU 4 capability is implemented, the Cisco router could be configured as an entry point to NetView and would support the full NetView command set.

Can it be done?

Not everyone is convinced that a PU 4-compatible router is such a great idea or that the router vendors will be able to develop one in the near future. Indeed, Cisco appears to be backing off somewhat from its original shipment schedule.

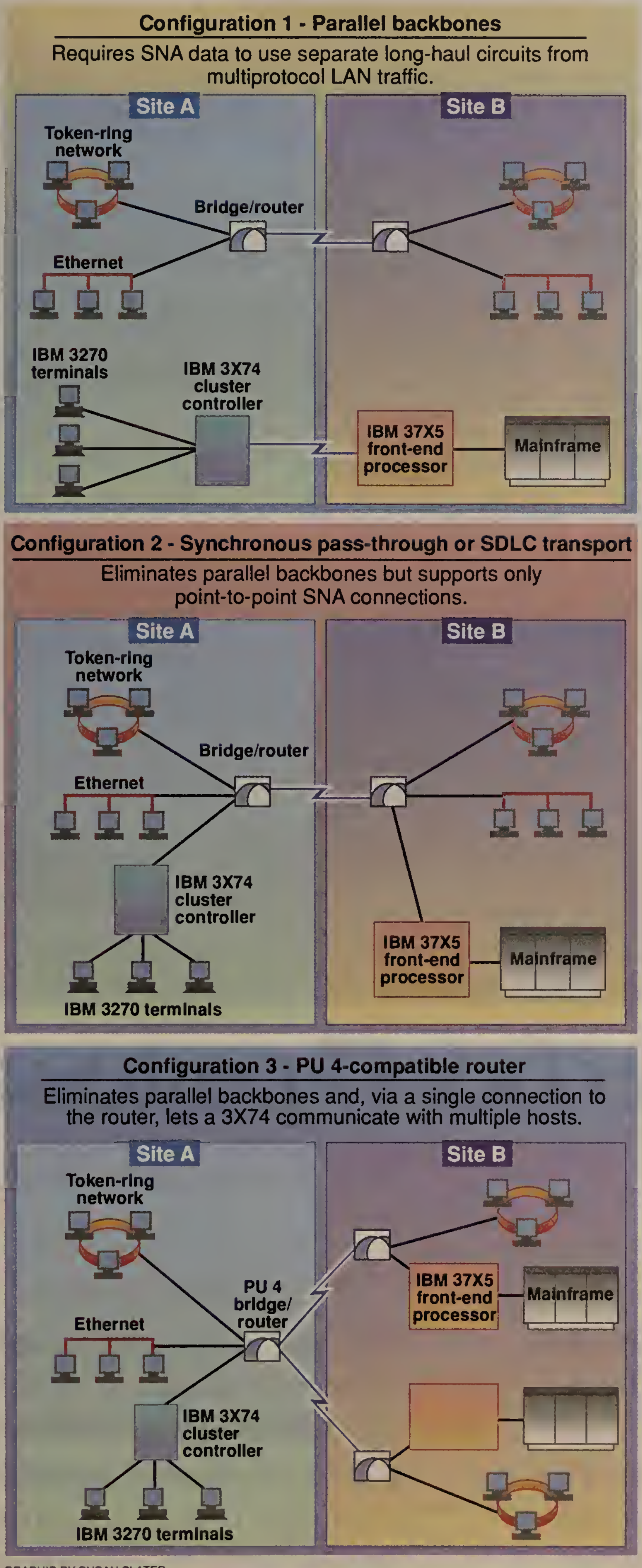
In January, when Cisco announced its intention to develop the PU 4 capability, the product was supposed to have shipped in about a year.

When interviewed a few weeks ago for this story, Cisco's Listwin said only that the product would be in beta test by year end.

Mohen said he expects Cisco will accomplish what it has promised, but he predicts that it will take some time for the company to get it right.

The PU 4 edge:
streamlining network configurations

Figure 2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Configuration 2 - Synchronous pass-through or SDLC transport
Eliminates parallel backbones but supports only point-to-point SNA connections.
Site A
Site B
Token-ring network
Bridge/router
Ethernet
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Configuration 3 - PU 4-compatible router
Eliminates parallel backbones and, via a single connection to the router, lets a 3X74 communicate with multiple hosts.
Site A
Site B
Token-ring network
PU 4 bridge/router
Ethernet
IBM 3X74 cluster controller
IBM 3270 terminals
IBM 37X5 front-end processor
Mainframe

GRAPHIC BY SUSAN SLATER

SNA experts stress how difficult it is for companies other than IBM to work with SNA routing.

Even acknowledged SNA powerhouses such as NCR Corp. haven't attempted to do what Cisco and the others are trying, notes Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C. consultancy.

Rather than go the PU 4 course, a number of router vendors, including Cisco, CrossComm Corp., Proteon and Wellfleet, have also announced or shipped some version of the encapsulation method.

Not everyone is convinced a PU 4-compatible router is such a great idea.

▲▲▲

Wellfleet, among the first to announce support for encapsulation, has no current plan to support the PU 4 capability, says Karen Barton, the company's director of product marketing.

Barton says IBM has invested heavily in its routing schemes, congestion management and path control, "all those kinds of things that are part of the SNA architecture that you don't get by three guys operating in a garage for a month and a half building a product," she says.

If its agreement with IBM goes through, Wellfleet would likely benefit from IBM expertise and not have to develop the PU 4 capability on its own.

So where does all this leave users? Will they be able to use multiprotocol routers to replace remote front-end processors and, if so, when?

There is no way of telling when vendors will be able to debug any PU 4 software they produce and ship a product. As Mohen points out, the router vendors are not SNA powerhouses and they will likely encounter troubled waters along the way.

If the IBM-Wellfleet deal goes through as expected, that team seems likely to have an edge in the race to produce a PU 4-compatible router.

However, since the deal hasn't even been officially announced and it's not clear if it will include a PU 4 router, users should not plan on benefiting from its outcome just yet.

Vitalink and Proteon are still question marks. So count on Cisco and possibly other router vendors to come through with a PU 4-capable product.

But don't hold your breath waiting. ◘

Industry Briefs

continued from page 9

Systems Center will provide its Net/Master network management software and related network offerings, while Andersen Consulting will complement those products with its network integration services and project management expertise.

Sears forms net unit. Sears Business Centers last week announced the formation of its Network Integration Division, a technical support team to help users build networks.

The new division comprises field systems engineers, network consultants, account executives and technical marketing managers who will focus on helping users install Novell, Inc. NetWare, IBM OS/2 LAN Server and Microsoft Corp. LAN Manager nets. Sears Business Centers, a division of Sears, Roebuck and Co., is an authorized reseller for AT&T, IBM and Novell, among others.

Cisco reports revenue. Cisco Systems, Inc. last week reported revenue of $49.7 million for its third fiscal quarter ended April 28, which is nearly triple the $17.8 million in revenue it reported for the third quarter last year. Cisco reported third-quarter earnings of $11.6 million, about a threefold increase over the $3.8 million in earnings it posted for the third quarter last year. John Morgridge, Cisco's president and chief executive officer, said he was "gratified with the company's results in this period of economic weakness." He pointed to strong sales of newer routers as a primary reason for the results.

CMA invites vendors. Breaking with tradition, the Communications Managers Association (CMA) recently voted unanimously to accept vendor firms as sustaining members into the previously all-user group. Vendors will not be given voting privileges but will be able to partake in other CMA activities.

According to Ron Kopitowsky, CMA president and telecommunications director at New York's Metropolitan Transportation Authority, the group invited vendors to join in order to foster better user-vendor partnerships. The sustaining category, open to telecommunications equipment firms, service providers and consultants, is one of four new membership classifications. The other three are student, honorary and retired members. ◘

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ISDN products support ACD

continued from page 2

puter that can support an Integrated Services Digital Network Basic Rate Interface (BRI) line to an ISDN-equipped AT&T Network Systems Group 5ESS or Northern Telecom, Inc. DMS-100 central office carrier switch.

The Controller software enables the processor to receive and send call routing information over the D channel of the BRI line with an ISDN central office switch. The Manager software runs on a separate Unix workstation and enables system administrators to monitor, manage and reroute calls.

The Client software runs on Unix-based agent workstations outfitted with ISDN BRI interfaces and Microsoft Corp.'s Windows 3.0 graphical user interface. Thus configured, the workstations can receive calls over a BRI line's 64K bit/sec B channel and get customer profiles from remote hosts over the 16K bit/sec D signaling channel.

Distributed call centers

Unifi also announced the first PhoneServer application, Distributed Call Center, which is software that runs on the PhoneServer Controller and enables users to create distributed call centers supporting far-flung agents.

The central office serving the PhoneServer Controller uses the ISDN Q.931 protocol to notify the Controller about incoming calls over the D channel of the BRI link. The Controller quickly determines where the call should be sent and issues a D channel message invoking an ISDN supplementary service that tells the switch to reroute the call to another location. Supplementary services, which include hold, transfer and drop, are supported by central office switch software.

The Controller also sends a message to the receiving agent workstation telling it that a call is on the way. It then establishes a session with either a local or remote host computer, instructing it where to send the customer profile data. The profile is downloaded from the host into the ISDN net using an X.25 link. It is then passed to the agent's terminal with the voice call over a BRI link.

Agents dial into the Controller to establish low-speed virtual X.25 circuits with the device. The Controller maintains the real-time status of each agent on the distribution network.

When the PhoneServer software is run on an Intel 80486-based microcomputer, it enables users to handle 10,000 busy-hour call attempts.

Analysts said Unifi's distributed approach to call processing will offer users a less expensive and more flexible alternative to ACDs and private branch exchanges configured as ACDs.

"Historically, call centers have featured huge and incredibly expensive ACDs to which agents' phones are directly connected," said Mary Johnston-Turner, a principal with Northeast Consulting Resources, Inc., a Boston consultancy. "With Unifi's system, agents can be anywhere on the public network that's served by an ISDN central office."

But the success of the company's software depends largely on the regional Bell holding companies' deployment of ISDN throughout their territories, analysts noted. "They're trying to leverage the capabilities of ISDN, but they must remember that ISDN is still held in great suspicion and is not widely deployed," Johnston-Turner said.

Distributed Call Center will be available in the second half of 1991 as part of Unifi's early ship program. The early ship package costs $65,000 and includes PhoneServer software, hardware, peripherals, 10 agent phones or ISDN BRI interface cards, installation, training and a one-year warranty.

N.Y. Tel proposes service

continued from page 4

through the alternative central office to the user's site. It does this by changing trunk translations in its tandem and Class 5 switching network, according to Joe DeMauro, director of new product development at Nynex Corp. in White Plains, N.Y.

Under Flexpath, users can also obtain interoffice circuits — dedicated circuits between their primary and alternative central offices — that can be used to route traffic around a failed circuit between their site and the primary central office, DeMauro said.

"This gives users added protection against outages that could affect their switched services," DeMauro said.

He added that the Flexpath tariff will enable customers to use circuits (including those for the interoffice pathway) from New York Telephone or any other New York-based local exchange carrier, such as Teleport Communications Group, to support Flexpath routing.

"We have completely unbundled the service," DeMauro said.

New York Telephone is currently offering Flexpath services to Bankers Trust Corp. in New York as a limited service offering, which is a custom arrangement for individual clients.

New York Telephone will add a monthly surcharge of between $100 and $143 for each T-1 Flexpath circuit from the customer premises to the alternative central office and a $35 monthly charge for routing translations, according to DeMauro.

For interfacility circuits, New York Telephone will assess users a $130 monthly charge plus $41 for each mile the circuit runs and a $320 monthly termination charge at each central office.

In addition, there is a onetime start-up cost of $4,800, DeMauro said.

Tools will drive applications

continued from page 2

grammers — ideally the end user — generate applications. While the idea of such enablers is not a new one, enablers developed to work with MAP 3.0 as an underpinning are.

MMS shields

Such MAP-specific application enablers shield the user from the complexity of working with the Manufacturing Message Specification (MMS), the communications protocol for devices on a MAP network, said Robert Tomenchok, systems engineer at Union Camp Corp., a paper manufacturer in Princeton, N.J.

Users can use icons and draw on-screen diagrams to depict the process they want to develop, such as extracting data from a programmable controller on the plant floor. The enabler translates users' commands into the underlying code needed to deal with MMS, the protocol used to carry out the task.

Despite claims to the contrary from vendors of MAP products, Tomenchok said MAP is difficult, as it lacks the set of support and configuration tools that are staples with proprietary networking architectures. That is one reason users have been slow to implement MAP nets, he said.

"I think we're seeing the forces that will turn the penetration up," said Jim White, cochairman of the MAP/TOP Users Group and an internal consultant at E.I. du Pont de Nemours & Co. in Wilmington, Del. Users that have implemented proprietary systems often resist switching to a new, unfamiliar one.

Last week, a number of vendors demonstrated application enablers that could make MAP more acceptable by making it easier to deal with MMS. One was Procos A/S, a Danish company that makes EasyMAP, an enabler that runs under OS/2 and uses the Presentation Manager user interface. The product is distributed in Canada and the U.S. by Applied Integration Management Corp. of Southfield, Mich.

Another was Cycle's new MMS Connect, which works with any application that supports the Windows Dynamic Data Exchange. That allows data coming from plant floor devices to be fed directly to Windows applications such as spreadsheets or data bases, said Jeffrey Robbins, director of development at Cycle.

EasyMAP also supports links to spreadsheets and data bases, which is an important feature, Tomenchok said. Union Camp is conducting a pilot test of EasyMAP and, by the end of the summer, intends to deploy it as the primary interface to control systems for its plant floor operators.

The spreadsheet link allows for data analysis and graphically representation in an easy to read manner, as well as storage for historical analysis.

The best application enablers are simple enough to use so that the operator responsible for a given process on the plant floor can develop applications that meet his needs, said Bruce Richardson, vice-president of Advanced Manufacturing Research, a consultancy in Cambridge, Mass. "It's easier to do that than to teach the process to a programmer," Richardson said.

Enablers can therefore save money by reducing application development costs. MMS Connect, for example, costs $2,495 for a version that communicates with a single MMS-compatible device or $3,995 for one that communicates with any number of devices.

Besides being a vehicle to further the use of MAP, the emergence of MAP-specific application enablers is a sign MAP is maturing, users said. MMS Connect, for example, is Cycle's only product, which shows the company and its financial backers perceive that there is enough of an installed base of MAP nets to make their company profitable.

"There's zero market for them without an installed base of MAP," White said.

If application enablers fuel the increased use of MAP nets, it could help eliminate another major MAP obstacle — price — by increasing the critical mass of installed MAP products.

Network Systems to buy Vitalink

continued from page 4

income of $13.3 million.

Industry observers, who noted that both companies' financials have been soft lately, were cautiously optimistic about the Network Systems and Vitalink union.

"It's hard to say whether this will spur both companies or send them both spiraling downward," said Susan Frankle, a research analyst at International Data Corp., a Framingham, Mass., market research firm.

According to Michael Howard, president of Infonetics Research Institute, Inc., a San Jose, Calif., market research firm, overlap between the two firms' offerings is minimal. "This is a deal where there may actually be synergy," he said.

Good news, bad news

A potential benefit of the acquisition, observers said, is that Network Systems' high-end and Fiber Distributed Data Interface bridge/routers will fill a gap in Vitalink's product line. Network Systems also will gain access to more commercial and low-end accounts, thanks to Vitalink's large installed base and its distribution agreement with Digital Equipment Corp., which is responsible for about 40% of Vitalink's sales.

A potential downside of the deal could be that because Vitalink has lost market momentum and engineering expertise in recent months, Network Systems may not get much for its money, observers said.

"I fail to see what technology benefits Network Systems would get from Vitalink," said Bill Fithen, manager of the data network at the University of Pittsburgh.

The consensus among observers, however, was that Network Systems is making a fairly safe investment because Vitalink has a strong cash position and revenue flow.

Although Network Systems is paying $146 million for Vitalink's stock, Vitalink has about $100 million in cash on hand. That means the acquisition should cost Network Systems less than $50 million, said Andy Schopick, an independent analyst in Southport, Conn.

That may seem like a paltry sum to pay for a company that just a few years ago charged to the forefront of the remote bridge market. But Vitalink's stature in the overall internetworking market has declined as market demand has shifted from bridges to multiprotocol routers in recent years.

Filling the holes

Vitalink still has holes to fill, including the need for lower priced products, said Dana Hendrickson, Vitalink's assistant vice-president of business development.

Under Network Systems' wing, Vitalink will be better equipped to provide users with a richer offering of internetworking products, featuring a wider variety of prices, sizes and protocol support, he said.

Lyle Altman, chairman, president and chief executive officer of Network Systems, said Vitalink makes an excellent strategic fit with his firm based on the customer base and distribution capabilities Vitalink has to offer.

The acquisition agreement, which is subject to shareholder approval, is expected to be completed next month, Altman said.

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Financial industry sees nets as key

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tems by brokerage firms increased at an average compounded annual growth rate of about 22%, from $1.1 billion to about $4.1 billion, according to consulting firm McKinsey & Company, Inc., based here.

These expenditures were made possible by soaring revenues and profits. Pretax profits for the securities industry as a whole peaked at $5.5 billion in 1986 on revenues of $50 billion, according to the Securities Industry Association here. The industry had its worst year in 1990, losing $162 million before taxes on revenues of $54 billion. Industry employment peaked in 1987 at 289,000 jobs and has since fallen back to 245,000, McKinsey said.

Changing business fortunes have had a dramatic impact on network operations. During the boom years, net managers tended to bring systems on-line as quickly as possible, rather than take the extra time to ensure that systems were implemented cost-effectively. But when profits evaporated, most brokerage firms were forced to take bold measures to improve operations.

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One firm that has tackled this task aggressively is Shearson Lehman. When Lane took over as director of telecommunications in January 1990, the company's networking expenditures totaled $353 million annually.

During a speech at the conference here, Lane said Shearson Lehman has carried out cost-cutting initiatives that slashed annual networking expenditures to $280 million by the end of the first quarter. These savings have been generated primarily by nuts-and-bolts management practices that had been slighted during the boom years.

For example, Lane said 58% of the cost savings came from renegotiating contracts with vendors for more favorable terms. Another 18% stemmed from reduced net usage due to declining business.

Fifteen percent of the savings came from implementation of more cost-effective technologies, including the use of virtual network services for automatic ringdown circuits instead of private lines. And an 8% cost reduction stemmed from implementation of a detailed program to review each vendor's bill for inaccuracies.

Lane said the cost-cutting efforts caught the attention of Shearson Lehman Chairman Howard Clark Jr. "The chairman said communications is the second biggest expense at Shearson and that what we were doing was of utmost importance to the firm," he said.

Likewise, Merrill Lynch & Company, Inc. moved aggressively during the downturn to implement a major new branch office network system that not only reduces costs, but improves strategic business operations, said DuWayne Peterson, executive vice-president for operations, systems and telecommunications at the company.

Peterson, who gave the keynote speech at the two-day conference, said the branch network system, called Prism, was installed between 1987 and 1990. Essentially, Prism consists of local-area networks in Merrill Lynch branch offices around the country linked to Merrill Lynch data centers here.

Previously, Merrill Lynch relied on paper-based systems as well as dumb terminals linked to mainframes in data centers around the country. These systems in some cases kept brokers from receiving trade confirmations for days. Now, trade confirmations are received instantly, vastly improving customer service. Peterson added that Prism, in conjunction with massive efforts to consolidate data centers and negotiation of a custom network package with MCI Communications Corp., have reduced Merrill Lynch's network expenditures by tens of millions of dollars per year. ◘

Novell forms support team alliance

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According to Jan Newman, vice-president of service and support for Novell, based here, TSA is based on a five-point plan.

First, Newman said, Novell and the participating companies agreed to cross-train their technical staffs. "We're sending trainers and technical people back and forth [between companies] so each can get at least a base-level knowledge of the other's products."

Second, the companies are exchanging technical information, meaning if a customer calls in with a problem, the support person will be able to access a historical data base of common product problems. And third, TSA companies will exchange actual products to use in one another's respective labs for testing.

The two final steps are administrative. Each company has dedicated a person to serve as the intercompany alliance contact to ensure that the support process does not stall. Novell has also set up a group to monitor the success of the new alliance. ◘

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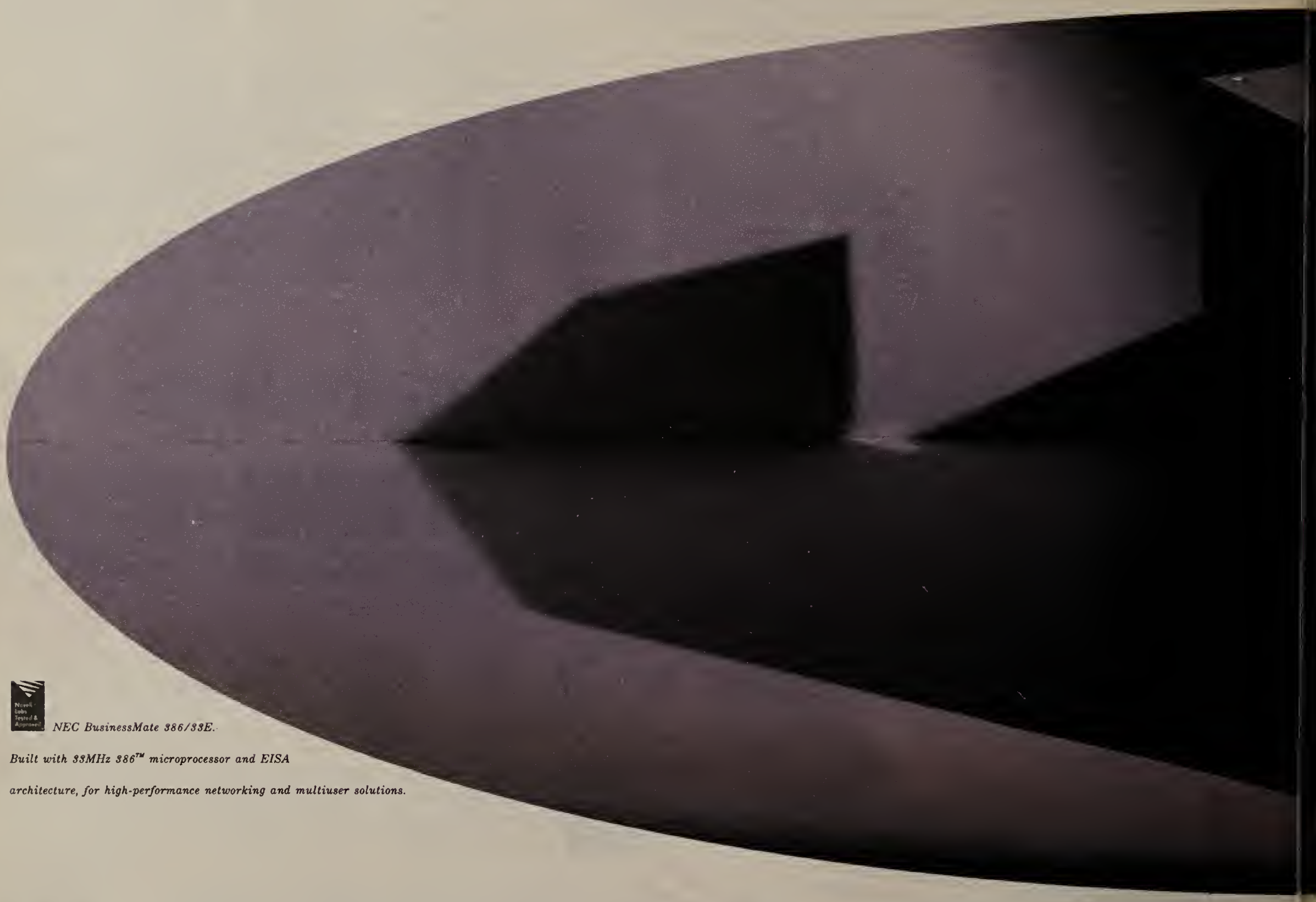

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Banyan to open VINES' services

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ogies would open up a whole new software market for the firm.

Sources said Banyan has been outlining its strategy for customers and resellers over the past few months. They say that the company has discussed offering its StreetTalk distributed naming/directory scheme as well as other services for The Santa Cruz Operation, Inc.'s (SCO) Unix. Enriched with these services, SCO Unix — which supports about 4,000 applications — would be a strong rival for NetWare.

Mahoney and D'Arezzo declined to discuss specific details of the company's strategy or talk about future product announcements. But they said Banyan is committed to open systems and standards, and will extend its directory and communications offerings, dubbed network services, to other platforms.

"We are looking at offering our services to span all computer environments. It shouldn't matter what platform or operating system is being used," D'Arezzo said.

Many analysts agree that Banyan's VINES network operating system was ahead of its time in addressing users' enterprise networking requirements.

Banyan has built a client base of key Fortune 500 corporations and government agencies with extensive LAN internetworks. Last week, Banyan announced a major networking contract award with the Canadian government that calls for installation of as many as 800 VINES networks over the next three years (see "Gov't agency installs VINES," this page).

Eric Sall, director of product management for Notes at Lotus Development Corp., said he believes Banyan clients have some of the most advanced network implementations. Lotus has developed a version of its Notes groupware that is designed to take advantage of Banyan's wide-area links.

In addition to StreetTalk, VINES features a networkwide security service called Vanguard, distributed applications, internetworking links, as well as various communications and network management facilities.

StreetTalk is used for identifying, locating and controlling access to users, services and resources across several LANs or a large geographically dispersed network. Using a descriptive three-part name by which users can easily identify the data base item, hierarchical directories are searched automatically when a name is referenced.

> "Expect aggressive product announcements in the next year. Over the next 12 months, you'll see more from Banyan than you've ever seen," D'Arezzo said.

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Banyan is now hoping to capitalize on these capabilities as well as its long-standing commitment to Unix.

Mahoney acknowledges that VINES was viewed as too costly and complex for smaller departmental LANs, but the company will benefit from the growing complexity of LANs and the increasing acceptance of Unix platforms. He said Banyan will be able to offer Unix users sophisticated directory and wide-area communications services, rather than simply file and print services.

"We're going to build on that differentiation through the rest of this year and into 1992" through a combination of marketing programs and product announcements, Mahoney said.

"Expect aggressive product announcements in the next year. Over the next 12 months, you'll see more from Banyan than you've ever seen," D'Arezzo said. He pointed out that Unix works well as a server operating system — even better than some of those now being developed.

Anand Jagannathan, president of Reach Software Corp., was one of the founders of Banyan and developers of VINES. He claims there is a great potential to leverage StreetTalk in the networking market.

"From day one, this system was architected to be portable across multiple platforms," he said. "Looking at it from a technological standpoint, it can be done since they have the compiler to port it to other Unix environments."

Craig Burton, chief executive officer of the Clarke Burton Corp., a consultancy in Salt Lake City, said he believes that Banyan's technological lead over Novell is due largely to its directory and naming services.

"It's taken Novell a year and a half to just deliver a kludgy naming scheme, while Banyan has spent years developing StreetTalk," Burton said.

While not discussing the company's plans in detail, Banyan's Mahoney said integration with Novell networks is a key concern of customers and is an issue the company will address over time.

Providing StreetTalk and other VINES services for NetWare could make it easier for Novell customers to build LAN internetworks, particularly if the capabilities are provided as NetWare Loadable Modules (NLM). Observers welcomed that possibility.

"If [they provided] a NetWare NLM, that would be very strong. It would be even better if it could also be integrated with Microsoft Corp.'s LAN Manager," said David Marshak, senior consultant with the Patricia Seybold Office Computing Group.

"If they pull this off and get the developers behind them, there could be a real ground swell [of support]," added Intel Corp.'s Dave Williams, a former director of strategic planning at both Banyan and Novell.

Gov't agency installs VINES

OTTAWA — The Employment and Immigration Canada (EIC), a government agency here, last week said it has awarded a contract that calls for the installation of as many as 800 Banyan Systems, Inc. VINES networks.

Under the terms of the $45 million contract, Banyan reseller Mohawk Data Sciences (MDS)-Canada, Ltd. will install as many as 800 VINES networks and 8,000 Acer America Corp. 386 personal computers over the next three years in 265 local Canada Employment Center offices.

The local-area networks will support office applications and provide direct links to Unisys Corp. mainframes at EIC's five regional computer centers.

According to Michael Briand, general manager of MDS, VINES was selected for its proven capabilities as an enterprise networking system — including its global naming scheme — and as a means of simultaneous support of both French and English speaking users, which was a primary requirement of the EIC.

MDS has already begun installing the networks and will handle all training, support and maintenance.

Other Canadian government agencies using VINES include the Department of National Defense, the Department of Public Works, the Department of Communications, the Department of Fisheries and Oceans, and the National Archives.

— *Tim O'Brien*

Racal Data fuses products

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vices such as T-3 circuits and Switched Multimegabit Data Services (SMDS).

As initially released, however, MCS requires users to purchase MCS versions of existing Racal Data Communications products, each of which has its own bus and port card slots. Data terminal equipment and LANs are connected to ports on the individual components. Eight components can fit in one cabinet, and up to 64 cabinets can be linked in a net.

The three main components of MCS are a Bandwidth Manager, which is a customized Omnimux T-1 multiplexer supporting as many as 256 ports and up to eight T-1 links; a Fast Packet Engine, which is a customized Racalan NetExpress router supporting up to six Ethernets; and a new Protocol Engine, which is a multiport device configured with software to act as a statistical multiplexer, terminal server, protocol converter or X.25 switch.

Data from incoming lines can be routed from the Bandwidth Manager across the system bus to a Protocol Engine, which can convert it and route it back across the system bus to a port on the T-1 multiplexer that provides host access. Likewise, LAN traffic received by the Fast Packet Engine can be routed across the system bus to the Bandwidth Manager, which provides T-1 circuit access.

Voice traffic coming into the T-1 component is routed to a PBX, obviating the need to packetize voice for transmission across the system bus.

The first MCS release supports Ethernet, IBM Synchronous Data Link Control, IBM Binary Synchronous Communications, IBM 2780/3780 remote job entry, Transmission Control Protocol/Internet Protocol, X.25, Digital Equipment Corp. Local Area Transport, DEC Digital Data Communications Message Protocol, High-Level Data Link Control and asynchronous traffic.

Initially, MCS can route 24,000 128-byte TCP/IP packet/sec. The next release, due out by year end, will route Open Systems Interconnection, Novell, Inc.'s Internetwork Packet Exchange (IPX) and DEC's DECnet.

MCS versions of Racal Data Communications' low-end Omnimux 800 and high-end Omnimux 9000 T-1 multiplexers will be added to MCS by year end, along with support for Integrated Services Digital Network's Primary Rate Interface, frame relay, SMDS, token-ring and Fiber Distributed Data Interface networks, as well as LAN hub functionality.

The first release of MCS is available now. A unit supporting LAN internetworking, protocol conversion, X.25 switching as well as T-1 multiplexing is priced at $90,000.

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GEIS rolls out software system

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The software is based on GEIS' BusinessTalk System, communications software that combines the functions of a key word search textual data base, electronic mail and electronic bulletin board and news clipping services.

Each SMCS workstation manages its own relational data base of sales files that can be sent from one workstation to another via GEIS' electronic messaging service.

Salespeople can also access information from other corporate departments such as manufacturing, distribution and accounting.

A salesperson wanting to obtain information on a product's scheduled completion date, for instance, could access manufacturing's centralized data base via GEIS' BusinessTalk system.

Like EDI, SMCS data such as product information, pricing updates and order status, also can be extended to trading partners and customers, thereby creating closer vendor/customer relationships.

Additional services include access to informational public data bases that sales representatives can use for lead qualification, market research and competitive information.

Conversely, information generated by sales can be used by other corporate divisions for strategic planning.

According to Barton Goldenberg, president of Information Systems Marketing, Inc., a Washington, D.C.-based consultancy specializing in sales automation tools, current systems typically have limited networking capabilities.

SMCS lets users access the SMCS data bases of colleagues, as well as other in-house and public data bases and value-added GEIS services such as EDI and facsimile.

"Sales assistance is the primary function of today's sales automation software, but the market is now demanding multifunctionality as well as integrated functionality," Goldenberg said. "A VAN's entrance into the market is significant because it assumes a sales application is networkable."

> The [sales assistance] market is now demanding multifunctionality as well as integrated functionality.

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Haggar Apparel Co. in Dallas implemented a personal computer-based sales automation application developed by GEIS several years ago.

Tom Sample, Haggar's senior vice-president of MIS, said the system — a precursor to GEIS' commercial launch of SMCS — has enabled the company to increase sales productivity and enhance customer service.

"Sales automation decreases the amount of time spent on routine administrative tasks and allows sales personnel to spend more time pitching sales and closing orders," he said. "We've been able to eliminate our data entry function and streamline the entire process."

Sample added that employees now sell more intelligently because more comprehensive data analysis can be gleaned from SMCS, thereby allowing sales and marketing personnel to know their customers better and target sales opportunities accordingly.

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